Final Report
Screening Site Inspection
Laclede Coal Gas
St. Louis, Missouri
EPA ID# MOD981715980
TDD #F-07-9008-020 PAN #FM00579SA
Site #Y33 Project #002
Prepared by E & E/FIT for the
Region VII EPA RPO
Project Manager: Keith Brown
Superfund Contact: Greg Reesor
Date: October 29, 1991

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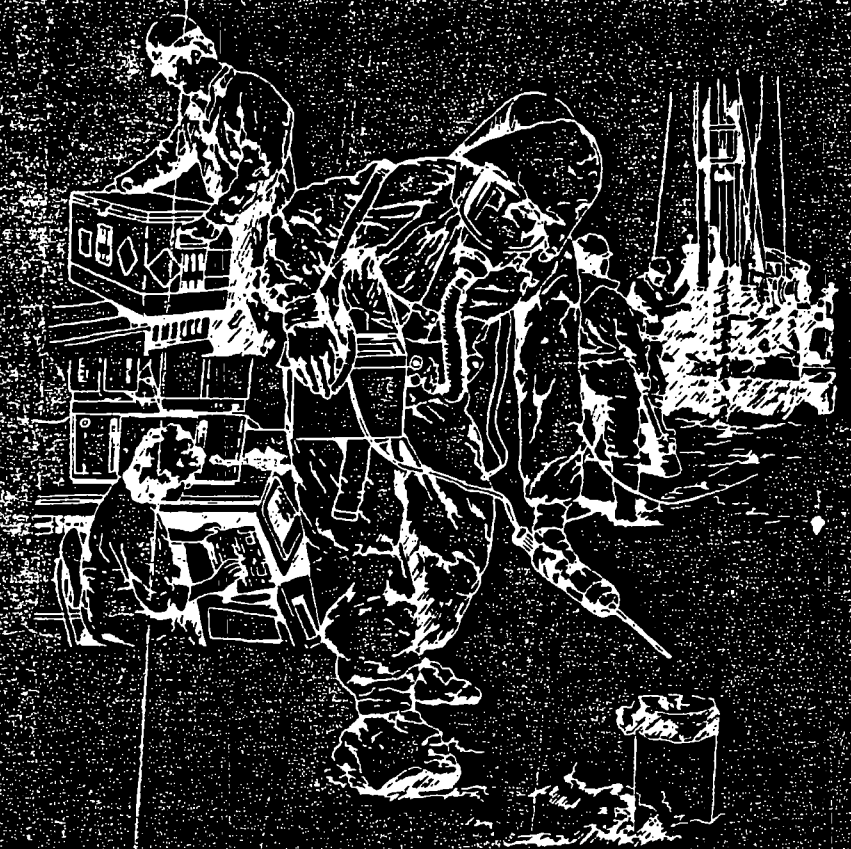
EPA

HAZARDOUS SITE EVALUATION DIVISION

Site: Laclede Coal Gas
ID #: MOD981715980
Break: 1.7
Other:
10-29-91

Field Investigation Team Zone II



ecology and environment, inc.
International Specialists in the Environment

CONTRACT NO.
68-01-7347

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SECTION 1: INTRODUCTION

The Ecology and Environment, Inc., Field Investigation Team (E & E/FIT) was tasked by the Region VII U.S. Environmental Protection Agency (EPA), through Technical Directive Document (TDD) #F-07-9008-020 (Appendix A) and EPA CERCLIS ID #MOD981715980, to conduct a Screening Site Inspection (SSI) of the Laclede Coal Gas site located in St. Louis, Missouri, foot of Mullanphy Street. The objectives of this SSI were to determine the approximate areal and vertical extent of subsurface contamination; to determine whether contamination is present in the 0 to 2 foot interval; to determine whether contaminants have migrated via surface water runoff, or via the ground water/surface water interface; and to determine whether any coal tar wastes present have leached into the shallow ground water.

The E & E/FIT conducted a site reconnaissance on November 20, 1990, to assess current site conditions and facilitate preparation of the SSI work plan. Participating FIT members included Keith Brown, Bob Overfelt, and Chris Williams. During this site reconnaissance, the FIT observed seepage from the foundation and piping system of an abandoned pump house that was formerly owned by the Mound Street Power Plant. Because this pump house is located on the east side of the flood control levee, this leachate was observed to be seeping directly into the Mississippi River.

During the SSI, the FIT collected subsurface soil, surface soil, surface water, ground water, sediment, and product samples. Initially, 24 locations were drilled with solid stem augers. Ninety-two samples were collected from these locations and screened on site in the mobile lab. Four of the sample locations determined by FASP analyses to be the most contaminated, as well as one background sample location, were resampled with hollow stem augers. Thirteen subsurface soil samples were collected from these 5 locations. Twelve surface soil samples were collected at 12 locations. Six surface water samples were collected at 4 locations. Six ground water samples were collected at 5 locations. Four sediment samples were collected at 3 locations. Two IDW samples were collected from 17 drums, and 1 oil sample was collected from an 80,000-gallon tank located on site. Additionally, two field/trip blanks, one auger/split spoon rinsate, and one Geoprobe pipe rinsate sample were

collected.

This report describes present site condition, dicussses site history and coal gas operations, the physical and cultural setting of the site, and presents and discusses the sample results of the FIT SSI. EPA Site Inspection Form 2070-13 was completed and is included as Appendix B.

SECTION 2: SITE LOCATION AND DESCRIPTION

2.1 SITE LOCATION

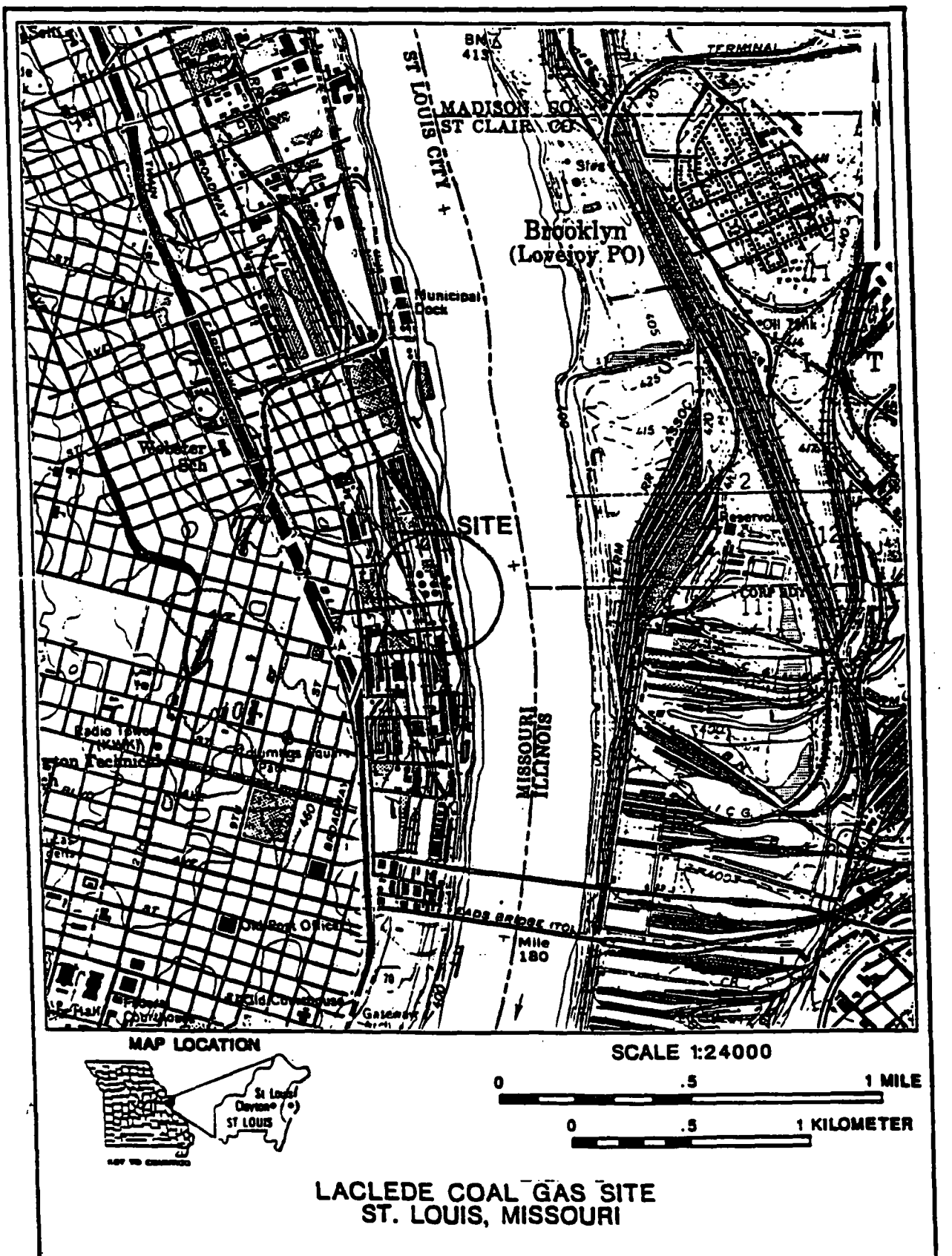
The Laclede Coal Gas site is located in St. Louis County, St. Louis, Missouri, approximately one mile north of the St. Louis Arch, along the Mississippi River at the foot of Mullanphy Street (Figure 2-1). The legal description of the site is city block 234-Tract #25, St. Louis Plan. The geographic coordinates of the site are 90° 11' 00" west longitude, and 38° 38' 20" north latitude. The site is situated in an industrialized area adjacent to the Mississippi River.

2.1 SITE DESCRIPTION

The site is a former manufactured gas plant (FMGP) (Figure 2-2). The dimensions of the site are approximately 600 feet by 500 feet. Currently, the site is owned and operated by Petroleum Fuels & Terminal Company (PF & T), a subsidiary of Apex Oil Company. PF & T operates a privately owned petroleum tank farm on site (Figure 2-3). The former Mound Street Power Plant building is owned by McKinley Iron and is located adjacent (northeast) to PF & T. The bulding was in the process of being raised during the SSI (E & E/FIT 1990).

The site is not secured and access to the ground is relatively unrestricted. There are locks on most of the doors of the site buildings and a fence surrounds the petroleum storage tanks. Also, there is a watchdog which lives within the fenced petroleum tank farm; no other security exists (E & E/FIT 1990).

The E & E/FIT conducted a site reconnaissance on November 20, 1990, to facilitate preparation of the work plan. The FIT observed seepage from the foundation and piping system of an abandoned pump house that was formerly owned by the Mound Street Power Plant. The pipes, which originate from the former plant, have been plugged with concrete, but seepage was still leaching through the concrete. Because this pump house is located on the east side of the flood control levee, this leachate was observed to be seeping directly into the Mississippi River.

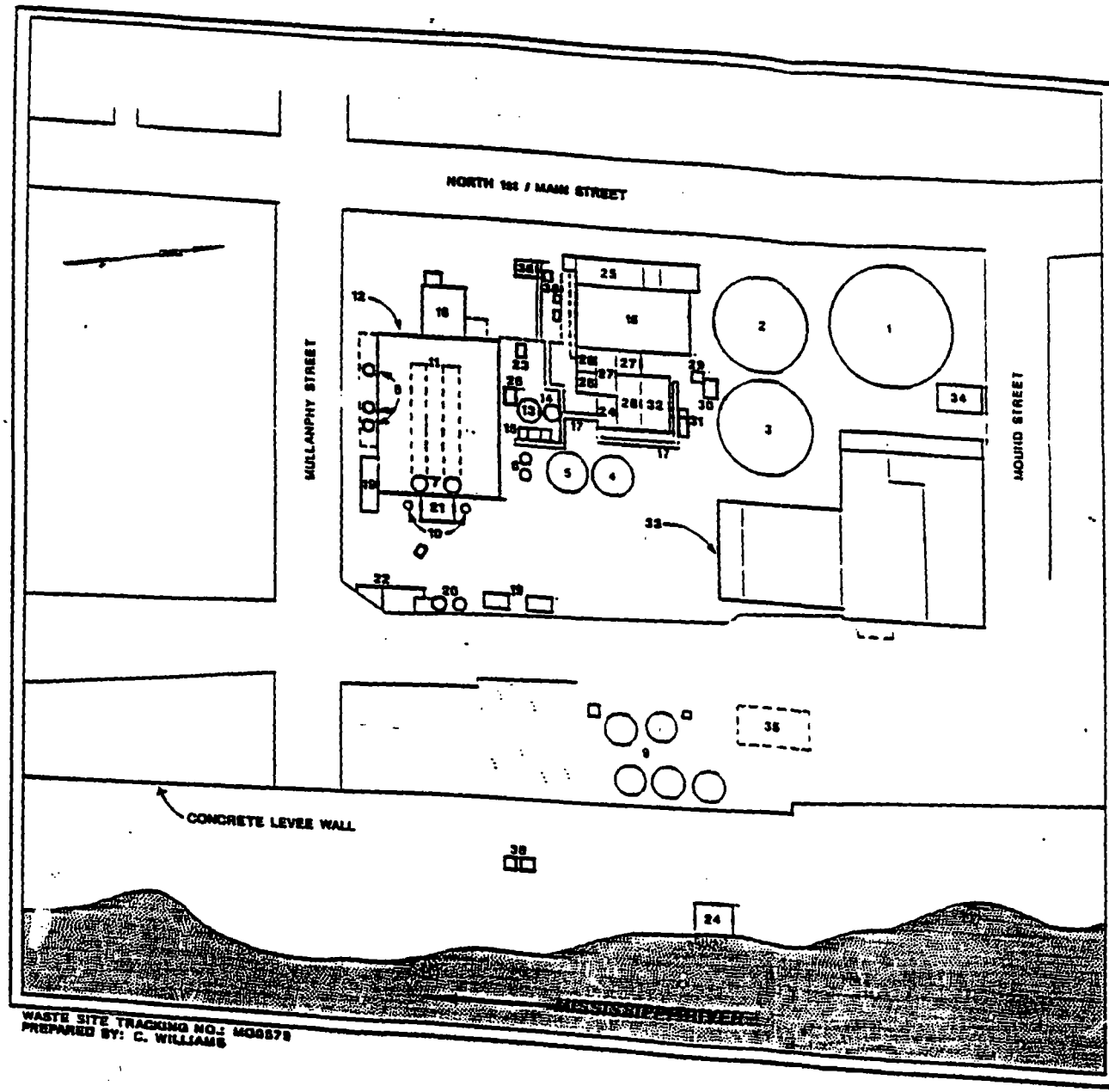


LACLEDE COAL GAS SITE
ST. LOUIS, MISSOURI

WASTE SITE TRACKING NO.: MO0579
PREPARED BY: C. WILLIAMS

ECOLOGY & ENVIRONMENT FIT JAN. 1988
SOURCE: USGS 7.5' GRANITE CITY, IL. QUAD. 1968

FIGURE 2-1 : SITE LOCATION



EXPLANATION

1. GAS HOLDER (787,937 Cubic Feet)
2. GAS HOLDER (656,451 Cubic Feet)
3. GAS HOLDER (337,388 Cubic Feet)
4. GAS PURIFIER (605 Cubic Yards)
5. GAS PURIFIER (605 Cubic Yards)
6. 2 - GAS SCRUBBERS (2,714 Cubic Feet Each)
7. 2 - TANKS, USE UNKNOWN (2,725 Cubic Feet Each)
8. 3 - TANKS, USE UNKNOWN (2,725 Cubic Feet Each)
9. 5 - FUEL OIL TANKS (150,725 Gallons Each)
10. 2 - RETORT SMOKE STACKS (80 Feet High And 6 Feet In Diameter Each)
11. 2 - BANKS OF RETORTS
12. RETORT HOUSE
13. AMMONIA WELL (56,711 Gallons)
14. AMMONIA WELL (22,525 Gallons)
15. TAR SEPARATOR (1,2244 Gallons)
16. PURIFIER HOUSE
17. PIPE TRENCHES (3 Feet Deep By 4 Feet Wide)
18. BLOWER HOUSE
19. GARAGE
20. TAR TANKS (53,844 Gallons Each)
21. STORAGE SHED
22. BLACKSMITH AND CARPENTER SHOP
23. STORAGE HOUSE
24. PUMP HOUSE
25. OFFICE AND METER ROOM
26. LABORATORY AND MACHINE SHOP
27. SCRUBBER HOUSE
28. CONDENSER HOUSE
29. GOVERNOR HOUSE
30. VALVE HOUSE
31. METER AND SWITCH HOUSE
32. EXHAUSTERS AND BLOWERS
33. LACLEDE ELECTRIC POWER FACILITY
34. OFFICE
35. TRANSFORMERS
36. UNKNOWN

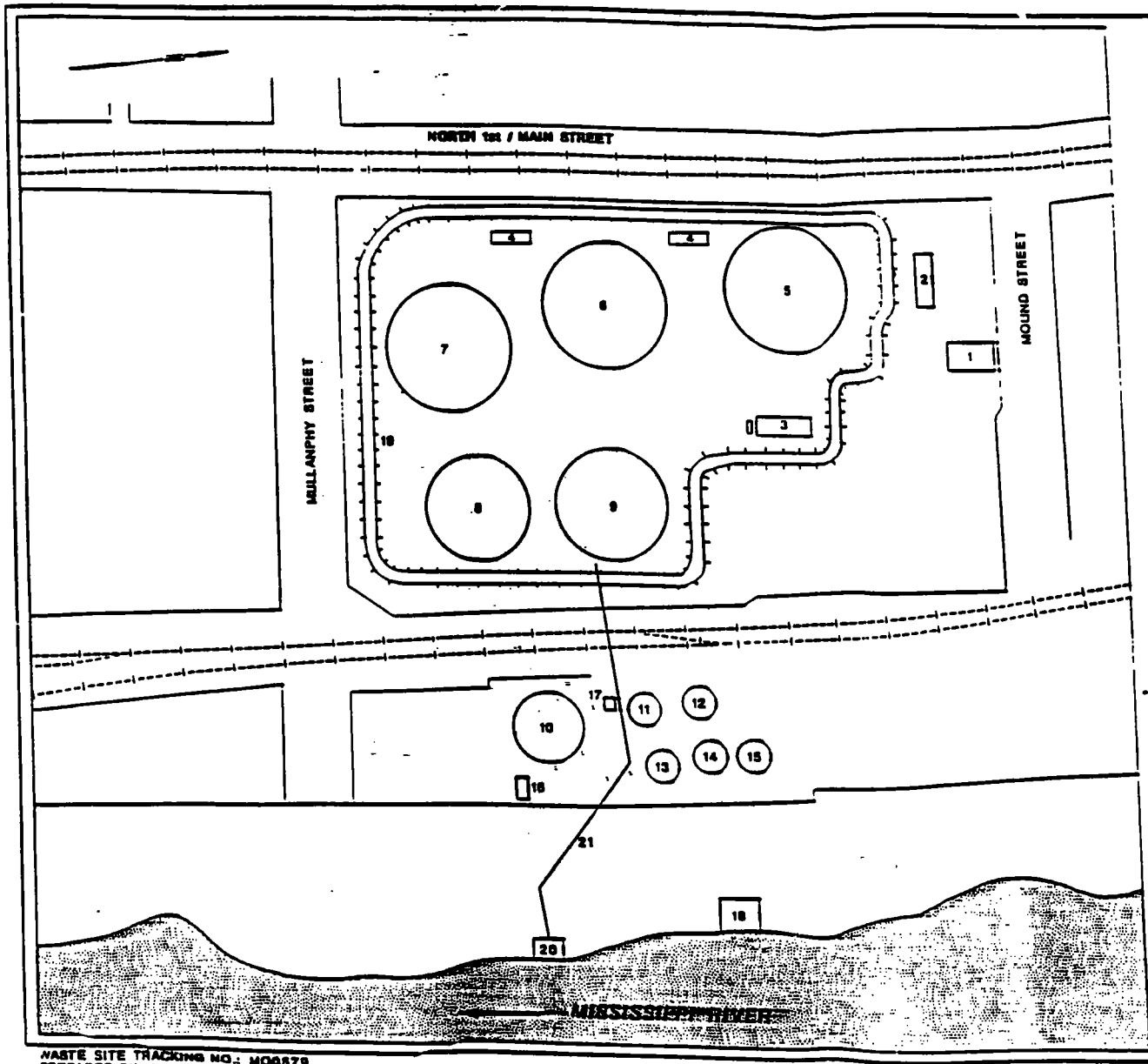
LACLEDE COAL GAS SITE:
(LACLEDE GAS AND LIGHT CO.)
ST. LOUIS, MISSOURI
CIRCA 1900

SCALE
0 200
FEET

WASTE SITE TRACKING NO.: MO0579
PREPARED BY: C. WILLIAMS

FIT JAN. 1988

FIGURE 2-2 SITE IDENTIFICATION MAP



EXPLANATION

APEX OIL COMPANY
ST. LOUIS TERMINAL STRUCTURES

1. OFFICE
2. TANKER TRUCK LOADING PLATFORM
3. EQUIPMENT SHED
4. EQUIPMENT/WORK SHOP
5. FUEL OIL TANK (80,000 Barrels)
6. FUEL OIL TANK (80,000 Barrels)
7. FUEL OIL TANK (80,000 Barrels)
8. FUEL OIL TANK (55,000 Barrels)
9. FUEL OIL TANK (55,000 Barrels)
10. OIL TANK
11. CRUDE OIL TANK
12. CRUDE OIL TANK
13. CRUDE OIL TANK
14. CRUDE OIL TANK
15. CRUDE OIL TANK
16. PUMP HOUSE
17. PUMP HOUSE
18. PUMP HOUSE (Abandoned)
19. CONTAINMENT BERM
    (For Fuel Oil Tanks, Capped With A Chain-link Fence)
20. PUMP HOUSE
21. RIVER TANKER OFF-LOADING PIPES

ecology and environment, inc.
CLOVERLEAF BUILDING 3, 6405 METCALF
OVERLAND PARK, KANSAS 66202

LACLEDE COAL GAS SITE
ST. LOUIS, MISSOURI

SCALE
0 200
FEET

WASTE SITE TRACKING NO.: MO6579
PREPARED BY: K. BROWN

FIT JAN. 1988

FIGURE 2-2 SITE IDENTIFICATION MAP
PRESENT DAY CONFIGURATION

2.3 SITE CONTACTS

Randel H. Lewis
Terminal Manager
Petroleum, Fuel & Terminal Company
Foot of Mullanphy Street
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(314) 621-0522

Dick Bloch
Assistant Terminal Manager
Petroleum, Fuel & Terminal Company
Foot of Mullanphy Street
St. Louis, MO 63105
(314) 621-0522

Bob Welch
Terminal Property Manager
Petroleum, Fuel & Terminal Company
Foot of Mullanphy Street
St. Louis, MO 63105
(314) 621-0522

Greg Reesor
Missouri Coordinator
U.S. Environmental Protection Agency
Region VII
726 Minnesota Avenue
Kansas City, KS
(913) 551-7695

See Appendix C for a breakdown of samples by property owners and for addresses and phone number of other interested parties.

SECTION 3: SITE HISTORY

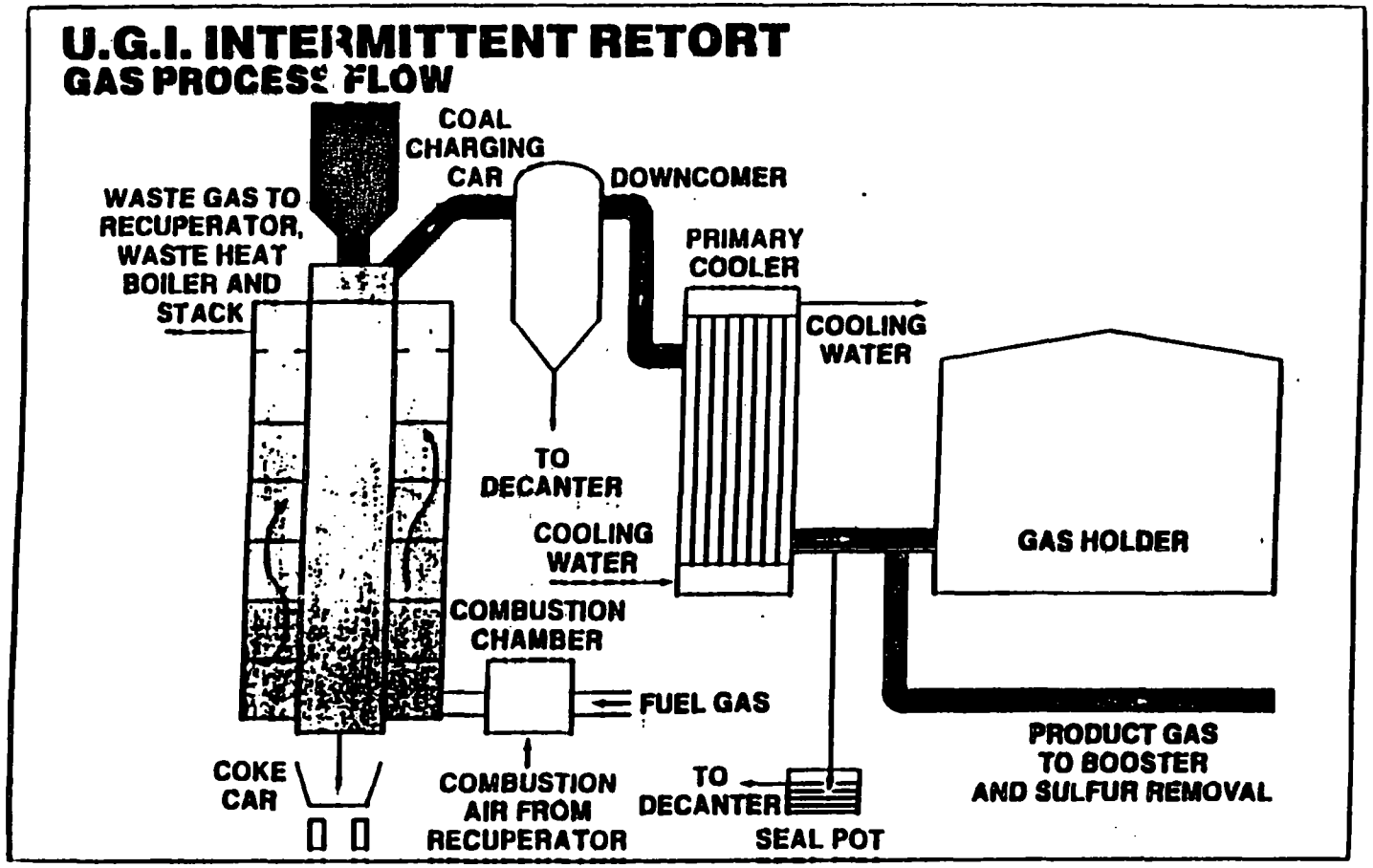
3.1 GENERAL SITE HISTORY

The earliest property records available indicate that this parcel of land was used by the Mound Street Warehouse Corporation, which sold the land and buildings to the Laclede Gas and Light Company on February 8, 1888 (E & E/FIT 1988). The Laclede Gas and Light Company constructed a large coal gasification plant on the property (Figure 2-2). According to the Brown's Directory of Manufactured Gas Plants, on March 23, 1940, the name of the facility was changed to the Laclede Power and Light Corporation (aka Laclede Electric), and the Laclede Gas Light Company (aka Laclede Gas). This suggests that the operations were separated, at least financially (Andrew 1890-1940).

Some time between 1940 and 1945, Phoenix Light, Heat and Power was involved in the Laclede operations; however, the extent of this involvement could not be determined during the background information search conducted for the work plan. On March 23, 1945, the entire facility was sold to Union Electric Company. According to Union Electric representatives, Union Electric Company never manufactured gas at this site (E & E/FIT 1988). Therefore, 1945 is the approximate closure date of the coal gasification works. Union Electric continued to use the electric power facility until 1973, though the former coal gas works was sold to the Apex Oil Company in 1969. Between 1969 and 1972, Apex Oil dismantled the old coal gas plant and constructed a petroleum tank farm on the site (Figure 2-3). This Apex facility stored various petroleum fuels until the mid 1980s when it became one of two Apex Oil asphalt product terminals in St. Louis. Currently, the terminal stores and distributes asphalt and #6 fuel oil (E & E/FIT 1988). Figure 2-2 depicts the Laclede Gas and Light Company as it appeared in the early 1900s; Figure 2-3 illustrates the current layout of the property.

3.2 FORMER SITE OPERATIONS

The major gas manufacturing process used at the Laclede FMGP was the UGI intermittent retort process (Environmental Research 1984)). This method produced gas through coal carbonization (Figure 3-1). During this process, coal is heated in the retort and the resulting coal gas is



THIS MANUFACTURED GAS MACHINE WAS THE MOST COMMON TYPE IN USE DURING THE PEROID OF OPERATION FOR THE LACLEDE FACILITY.

FIGURE 3-1

removed through its top. The gas is run through a condenser and a scrubber before it is moved into the gas holder. Wastes are produced in the condenser and scrubber and in the retort itself. The coal is carbonized in batches and the resulting coke is discharged after each period of carbonization. It was common practice in the early 1900s for manufactured gas plants to bury some of their wastes in unlined pits on site. Most of the coal tars, approximately 76 percent, were sold to coal tar refineries for further processing.

3.3 PAST INVESTIGATIONS

On April 8, 1987, Daniel Wilson, Environmental Sanitation Specialist for the St. Louis Division of Health, collected oil samples in the basement of the former Mound Street electric power plant, where hydraulic oil from electrical transformer allegedly was stored. Six samples were collected and analyzed for polychlorinated biphenyls (PCBs). According to this analytical report, none of the samples showed PCB contamination, though the detection limits were not included on the data transmittal (E & E/FIT 1988).

On September 17, 1987, the E & E/FIT conducted a site reconnaissance to aid in preparing a Preliminary Assessment report of the former Mound Street Power Plant. Six liquid samples were collected from the basement of the facility, and two samples were collected from two different manholes adjacent to the facility. All samples were screened for PCBs at a 1 part per million (ppm) detection limit. No PCB contaminants were identified by the Tracor gas chromatograph utilized by the FIT Field Analytical Support Program (FASP) (E & E/FIT 1988).

The E & E/FIT conducted a second site reconnaissance on November 20, 1990, to facilitate preparation of the work plan. The FIT observed seepage from the foundation and piping system of an abandoned pump house that was formerly owned by the Mound Street Power Plant. The pipes, which originate from the plant, had been plugged with concrete, but seepage was still leaching through the concrete. Because this pump house is located on the east side of the flood control levee, this leachate was observed to be seeping directly into the Mississippi River (E & E/FIT 1990).

SECTION 4. WASTE CHARACTERISTICS

4.1 WASTE STREAMS

The two waste products of primary concern are tar sludges (coal tars) and spent oxides. Ammonia wastes are by-products of this production process, but are not considered hazardous. Coal tar wastes are primarily polynuclear aromatic hydrocarbons (PAHs) and phenolics produced during coal or coke combustion and during the oil injection process. Some of the PAH compounds likely to be present in the tar wastes are carcinogenic and listed as RCRA Part 261 hazardous wastes. All PAHs can be considered as carcinogenic as benzo(a)pyrene, a Class A carcinogen. Spent iron oxide wastes are produced during the gas purification process where impurities are removed from the manufactured gas. Iron oxide wastes contain sulfur compounds, cyanide compounds, and small quantities of coal tar. Light aromatics such as benzene, toluene, and xylene (volatile organic compounds) also are occasionally constituents of coal tar wastes.

Two types of cyanide may be present at a coal gasification site: simple and complex cyanides. Simple cyanides are formed when cyanide reacts with an alkali or metal, producing a soluble material that can liberate a CN^- anion in water. Simple cyanides can be decomposed by bacteria in the soil (Environmental Research 1984). Complex cyanides are alkali-metal cyanides that are relatively insoluble (Environmental Research 1984). Complex cyanides, particularly the ferrocyanide compounds, are more resistant to biodegradation. These materials are associated with oxide wastes.

The trace metals most likely to be found on a coal gasification site are: arsenic, chromium, copper, iron, lead, nickel, and zinc (Environmental Research 1984). All are readily adsorbed onto soil particles. The mobility of these constituents is controlled by the pH of the soil. As a general rule, the solubility of these metals increases as pH decreases. Low pH values also reduce the cation exchange capacity of the soil matrix due to the preferential adsorption of H^+ ions. Cation exchange is generally considered the major barrier to metal transport in soils. The strong tendency of metals to be bound to soil particles and organic matter limits their impact on ground water resources.

PAH and phenolic compounds may enter the atmosphere through

volatilization. Once in this matrix, the materials may undergo molecular or advective diffusion. (All further references to dispersion characteristics will infer both molecular and advective processes). PAH compounds are likely to undergo dispersion when introduced into surface water. If this occurs, the contaminants are very susceptible to adsorption onto clay particles suspended in the water. Depending on the nature of the surface water, this material may also volatilize; thus entering the atmosphere. Once in the surface water, the PAH compounds are prone to chemical alteration through biodegradation or photolysis. They are not readily absorbed to clay particles. These compounds may also undergo volatilization and limited biodegradation in surface water (Environmental Research 1984).

PAHs in ground water are also likely to undergo dispersion and adsorption processes. However, biodegradation of these materials is unlikely in this matrix (Environmental Research 1984). Phenolic compounds in ground water can be transported through dispersion. It is possible that these chemicals may undergo limited biodegradation in ground water environments.

In the soil matrix, PAHs can be involved in the adsorption process as well as biodegradation reactions. These materials may also undergo volatilization, leaching, and photolysis depending on site-specific characteristics. Phenolic compounds in the soil environment can be leached readily or removed through biodegradation (Environmental Research 1984).

PAH compounds are stable and tend to be retained in sediments. The specific stability of a particular PAH compound is dependent on its chemical structure (Environmental Research 1984; EPA 1980). Generally, the stability/solubility is inversely related to the molecular weight of the PAH. The arrangement of rings is also important. For example, anthracene is relatively soluble. It is a medium mass PAH composed of three linear rings. The arrangement of the rings allow this relatively massive molecule to be soluble. Benzo(a)pyrene is composed of a single ring surrounded by rings of three sides of its six sides. It is one of the more massive PAHs. The basic structures of the major PAHs are shown on Figure 4-1.

Component	Formula	Structure	Boiling Point, °C
Benzene	C_6H_6		80
Toluene	C_7H_8		111
Xylenes	C_8H_{10}		138-144
Phenol	C_6H_5OH		181
Cresols	C_7H_7OH		191-202
Xylenols	C_8H_9OH		201-227
Pyridine	C_5H_5N		115
PAH COMPOUNDS — Naphthalene	$C_{10}H_8$		218
Methylnaphthalenes	$C_{11}H_{10}$		241-245
Dimethylnaphthalenes	$C_{12}H_{12}$		262-269
Acenaphthene	$C_{12}H_{10}$		277
Carbazole	$C_{12}H_9N$		355
Fluorene	$C_{13}H_{10}$		297
Anthracene	$C_{14}H_{10}$		340
Phenanthrene	$C_{14}H_{10}$		340
Fluoranthene	$C_{16}H_{10}$		393
Pyrene	$C_{16}H_{10}$		394
Chrysene	$C_{18}H_{12}$		436
Benz(a)anthracene	$C_{18}H_{12}$		438
Benzo(j)fluoranthene	$C_{20}H_{12}$		~480
Benzo(k)fluoranthene	$C_{20}H_{12}$		480
Benzo(a)pyrene	$C_{20}H_{12}$		496
Benzo(e)pyrene	$C_{20}H_{12}$		493
Perylene	$C_{20}H_{12}$		460
Benzo(g,h,i)perylene	$C_{22}H_{12}$		500
Benzo(b)chrysene	$C_{22}H_{14}$		~500
Dibenz(a,h)anthracene	$C_{22}H_{14}$		-

Source: Environmental Research 1984

Chemical Compounds Associated with Coal Gasification

FIGURE 4-1

4.2 WASTE QUANTITY

The Laclede Coal Gas facility operated for almost 60 years, producing approximately 932,640 million cubic feet of gas (Andrew 1890-1940). According to the Handbook on Manufactured Gas Plants, approximately 1 gallon of tar waste is accumulated for every 1000 cubic feet of gas produced (Environmental Research 1984). Using this conversion factor, approximately 932 million gallons of tar waste were produced at the Laclede Coal Gas facility. According to the Handbook on Manufactured Gas Plants, approximatley 76% of the tar waste produced was sold. The other 24% was probably buried on site. Therefore, approximately 223,680,000 gallons of coal tar could be buried on site. It was common practice for FMGPs to bury their waste on site in pits or unlined trenches.

SECTION 5: PHYSICAL AND CULTURAL SETTING

5.1 CLIMATOLOGY AND DEMOGRPHY

The climate of the St. Louis, Missouri, area is classified as consistent with cold winters and long, hot summers. Heavy rains occur mainly in the spring and early summer months (USDA 1982). The total annual precipitation for St. Louis is 36 inches (USDA 1982). Net precipitation is 0 inches and the one-year, 24-hour rainfall is approximately 3.0 inches (USDA 1982). The average relative humidity in mid-afternoon is about 60 percent; with a higher humidity at night and the average at dawn is about 80 percent. The prevailing wind is from the south (USDA 1982).

The total population within four miles of the site is 207,102 (EPA 1989). The nearest individual is located approximately 1/4 mile from the site. The only resource within one-half mile of the site is the Mississippi River, located directly east of the site.

According to the Missouri Department of Conservation, it is not likely that any sensitive environments or critical habitats occur within a four-mile radius of the site. The possible exception is the Sicklefin Chub, (Hybopsis meek), which occurred in the Mississippi River in 1944 and may still occur in the area (Dickneite 1991).

5.2 TOPOGRAPHY AND DRAINAGE

The site topography is essentially flat with a very gentle slope (0 to 3 percent) to the east. Locally, the slope has been modified around buildings and other facilities. All runoff is impeded by a 500-year Corps of Engineers flood wall, which separates the site from the Mississippi River (Borgestede 1990). Overland flow is diverted into a storm sewer system that is connected to a sanitary sewer line. All water entering the sanitary sewer system flows underground to the Bissle Point Treatment Plant located approximately 2.5 miles upstream from the site. The water is treated by primary settling tanks; however, construction of a secondary treatment plant is three years underway. Treated water from this plant is discharged into the Mississippi River approximately 2.5 miles north (upstream) of the site (Borgestede 1990).

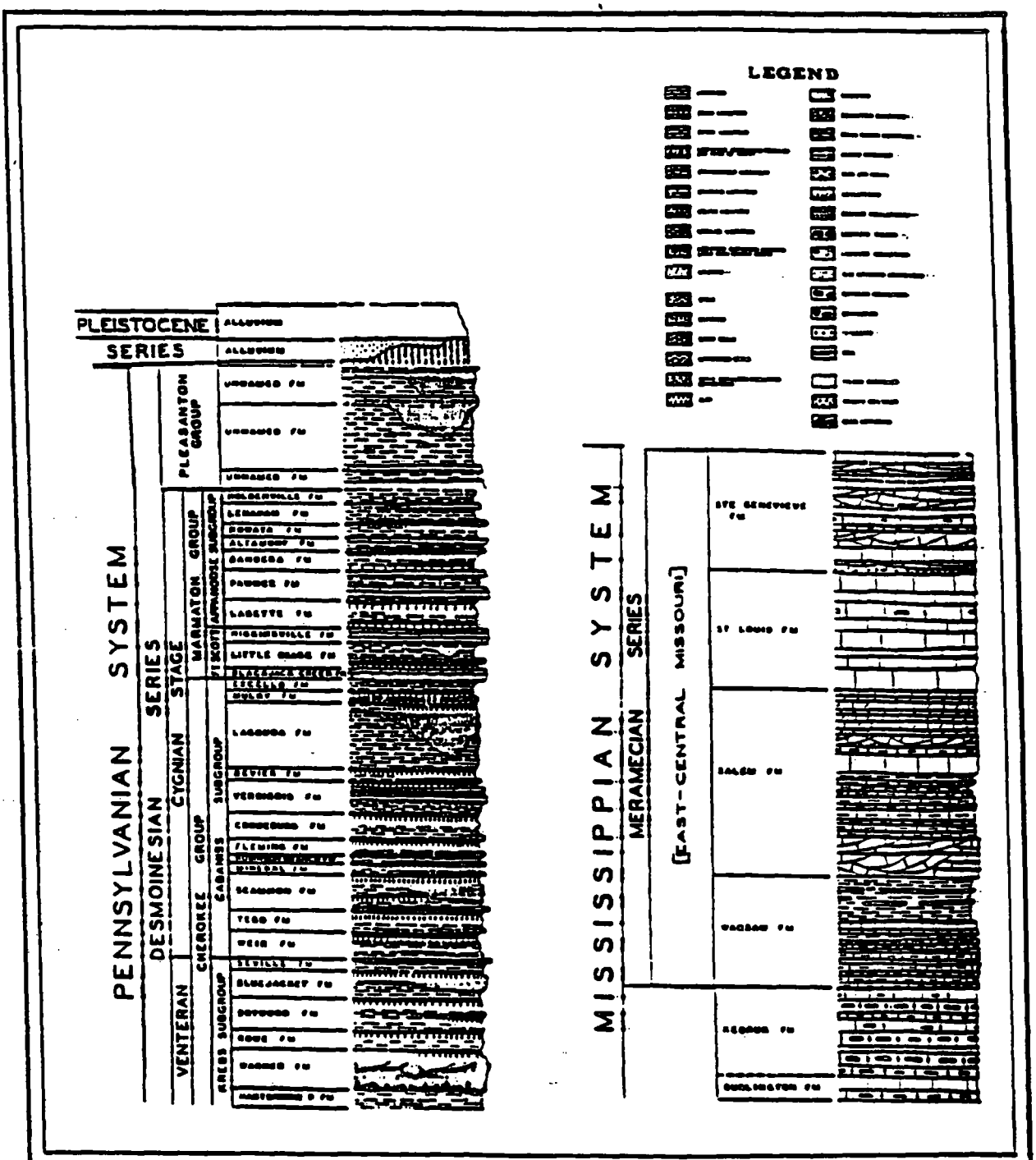
5.3 SOILS

The site is situated on Urban bottomland, which is defined as land with more than 85 percent of the surface covered by asphalt, buildings, or other impervious materials (USDA 1982). The area was built up to protect the site from flooding. The amount of fill in the area can range from 0 to over 20 feet. Because of this high degree of variability, classifying the exact nature of the area soils is impractical without a detailed on-site soil analysis. However, generally the soil types found at the Laclede Coal Gas site are periodologically characterized as loessial. These unconsolidated loess deposits of Quaternary Age can vary in thickness up to 50 feet. Residual soils underlie these loess deposits and were formed from decomposition of limestone bedrock (MGS 1971).

5.4 STRATIGRAPHY AND GROUND WATER

The upper bedrock beneath St. Louis County in east-central Missouri belongs to the Upper Mississippian and Lower Pennsylvanian systems. Figure 5-1 shows that these systems are subdivided, in descending order, into the Pleasanton, Marmaton, and Cherokee groups of the Pennsylvanian System, and the Mermacian Series of the Mississippian System (MGS 1961). Figure 5-2 is a generalized stratigraphic column primarily prepared from two well logs obtained from the Division of Geology and Land Survey, Missouri Department of Natural Resources (MDNR) and the drilling and sampling logs prepared during the SSI. The drilling and sampling logs are included in Appendix G.

According to the two well logs obtained from the MDNR and the drilling and sampling logs prepared during the SSI, the depth to bedrock varies in the site vicinity. The drilling and sampling logs (Appendix G) indicate that this depth ranges from 23 feet (at borehole 24) to 29 feet (at borehole 07). The well logs (Appendix F) indicate that the depth to bedrock is between 20 and 25 feet. However, this depth would increase as the distance to the Mississippi River decreases. To simplify the generalized stratigraphic column, the depth to bedrock was rounded to 30 feet. This 30 foot thickness is comprised of unconsolidated loess and alluvial (Mississippi River) deposits of the Quaternary System. Figure 5-3 depicts the alluvium thickness along the Mississippi River. In addition to these deposits, fill materials ranging from 0 to 20 feet or



LACLEDE COAL GAS SITE

ST. LOUIS, MISSOURI

WASTE SITE TRACKING NO.: MO0579
PREPARED BY: JOHN C. PARKS

ECOLOGY AND ENVIRONMENT FIT DEC. 1987
SOURCE: MGSWR 1961

FIGURE 5-1 : GENERALIZED STRATIGRAPHIC SECTION ST.LOUIS COUNTY, MISSOURI.

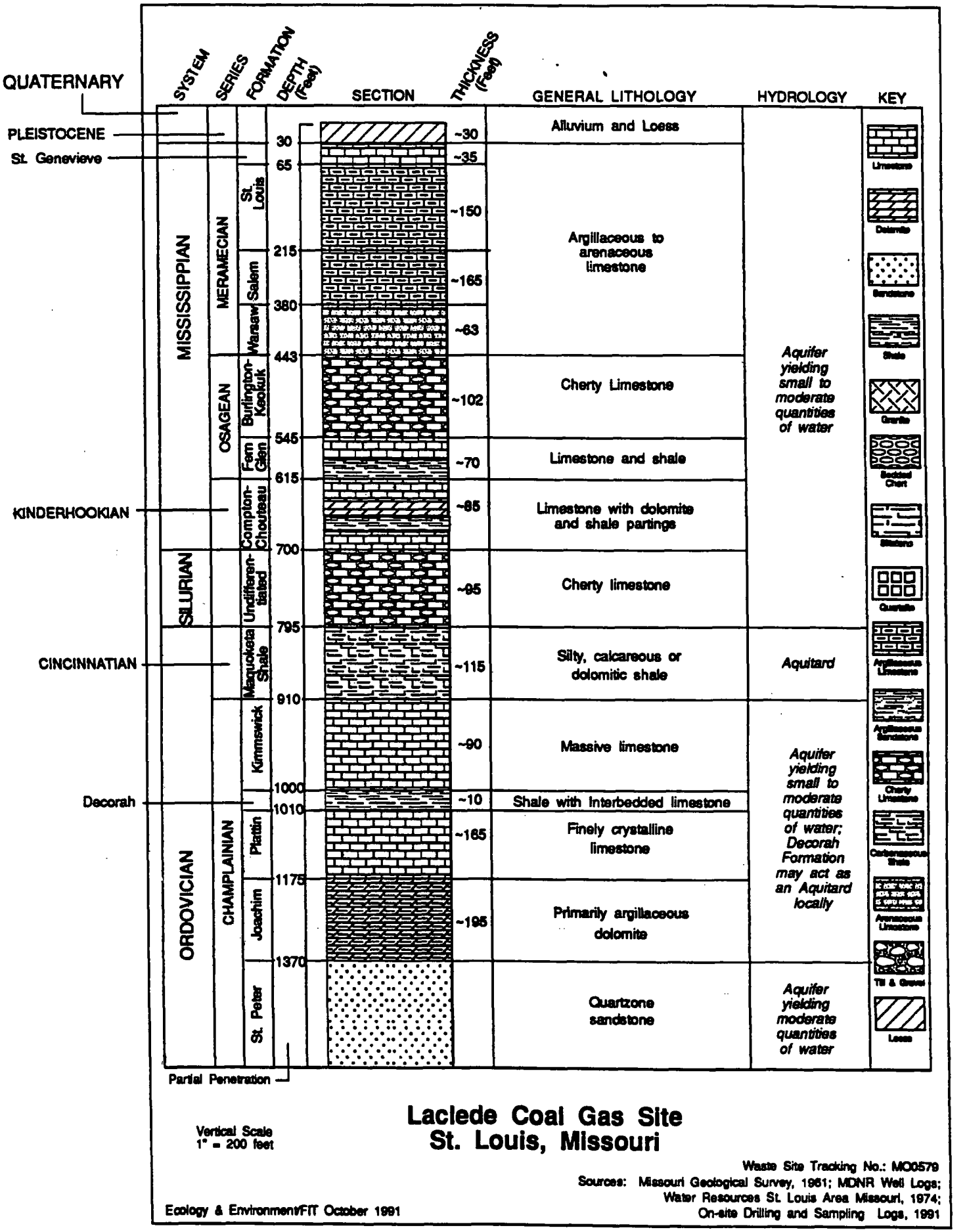
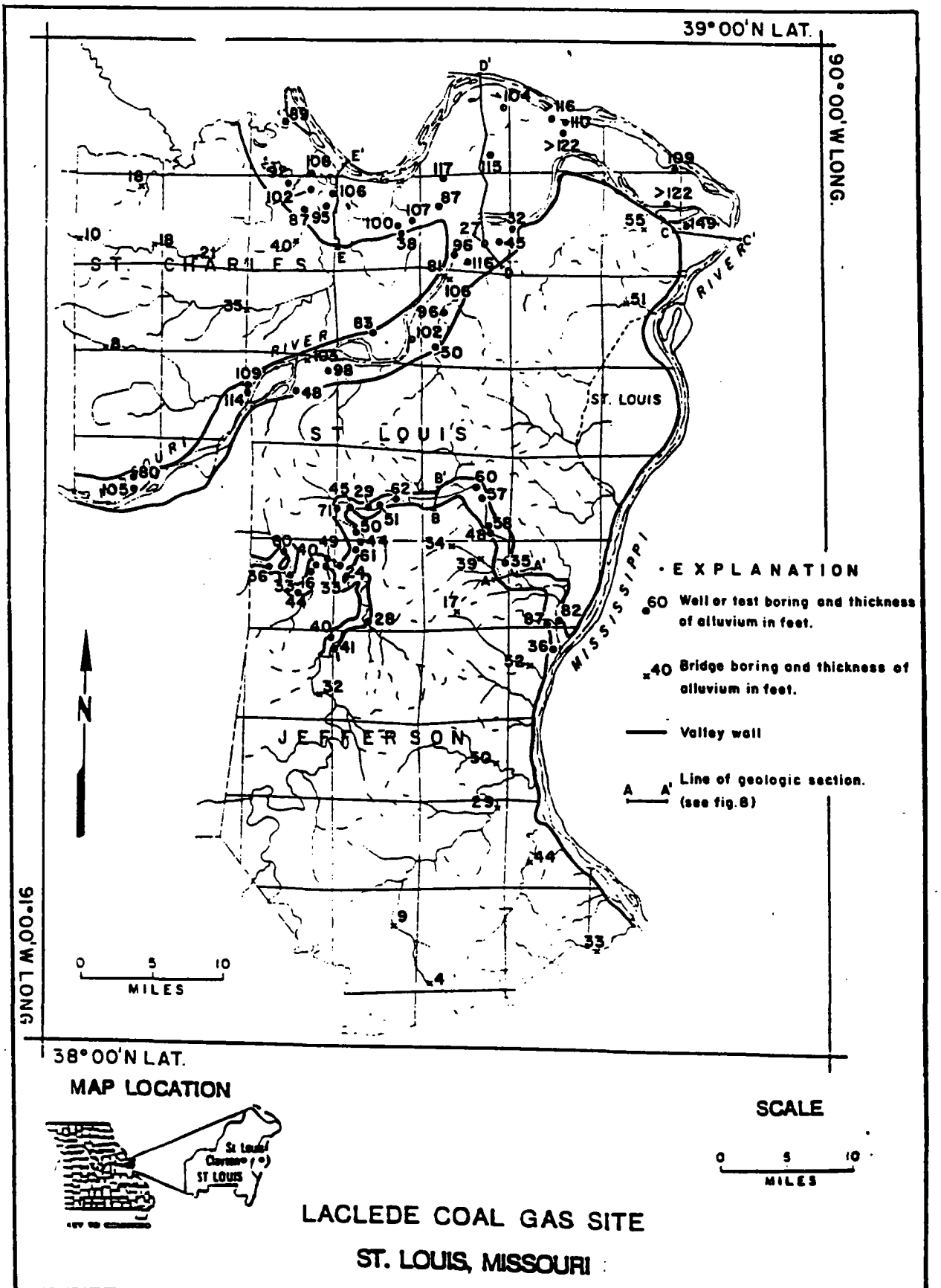


Figure 5-2: Generalized Stratigraphic Column



WASTE SITE TRACKING NO.: MO0578
PREPARED BY: JOHN C. PARKS

ECOLOGY AND ENVIRONMENT FIT DEC. 1987
Source: MGSWR 1974

FIGURE 5-3 : ALLUVIUM THICKNESS ALONG THE MISSOURI, MISSISSIPPI AND MERAMEC RIVERS ST. LOUIS COUNTY MISSOURI

more was placed at the site in order to protect the area from flooding.

The first bedrock encountered below the site is the Mermacian Series of the Mississippian System. The Mermacian Series consists of four formations (Fm.), which in descending order include the St. Genevieve, the St. Louis, the Salem, and the Warsaw. These formations are composed primarily of limestone and have a total thickness of 300 to 450 feet in east-central Missouri (MDNR Undated).

The St. Genevieve Fm. consists of white, massively bedded, sandy, clastic limestone. Although there are some thin beds of finely crystalline limestone, the limestone is primarily coarsely crystalline and oolitic. The lower portion of the formation is sandy, white to light tan or light olive gray, and is cross bedded and ripple marked. The middle of the formation consists of layers of red and gray chert with lenses and beds of sandstone occurring locally. Certain beds contain notable amounts of limonite which lines small cavities in the rock. Fossils are irregularly distributed in the formation. The thickness of this formation is approximately 30 feet in the county and approximately 35 feet at the site (MGS 1961; MDNR Undated).

The St. Louis Fm. consists of gray lithographic to finely crystalline, medium to massively bedded limestone which can be more than 100 feet thick in the county (MGS 1961). At the site, this formation is approximately 150 feet thick (MDNR Undated). Limestone brecia with a shale matrix between blocks of breccia is common in the lower portion of the formation. Blue to bluish-gray shale also occurs in thin beds throughout the formation. Chert is not common, but when observed it is usually brown and in the form of small angular fragments. Parts of the formation are locally dolomitic (MGS 1961).

The Salem Fm. thickest exposures are found in St. Louis, St. Genevieve, and eastern Perry Counties. The thickness of this formation generally ranges from 100 to 160 feet (MGS 1961). The thickness of this formation at the site is approximately 165 feet (MDNR Undated). The limestone contained in the formation is more dolomitic as compared to the other three formations in the Mermacian Series. The upper portion is fossiliferous and contains blastoid, crinoid, echinoid, and bryozoan debris. Also the upper portion contains speckled gray and tan chert (MGS 1961).

The Warsaw Fm. can outcrop in St. Louis County and where outcrops occur, the thickness of the formation is between 80 to 100 feet (MGS 1961). At the site, this formation is approximately 63 feet thick (MDNR Undated). This formation consists primarily of finely crystalline shaley, very fossilferous, dolomitic limestone in the lower portion, and dark, fissile shale in the upper portion (MGS 1961).

According to the MDNR well logs, the lower bedrock units beneath the site vicinity include: the Burlington-Keokuk Limestone Fm., the Fern Glen Fm., and the Compton-Chouteau Fm. of the Mississippi System; an undifferentialed fm. of the Silurian System; and the Maquoketa Shale Fm., the Kimmswick Fm., the Decorah Fm., the Plattin Fm., the Joachim Dolomite Fm., and the St. Peter Sandstone Fm. of the Ordovician System (MDNR Undated). These bedrock formations will be discussed briefly below.

The Burlington-Keokuk Fm., consists primarily of white to light buff, very coarsely crystalline, fossiliferous, crinoidal limestone. Layers of chert nodules are common, particularly in the upper portion. In east-central Missouri, the thickness of the combined formation is about 125 feet (MGS 1961). Near the site the combined formation is approximately 102 feet thick (MDNR Undated).

The Fern Glen Fm. consist of gray, grayish-green, and red limestone, and green and red calcareous shale. In central St. Louis County, the predominate color of the limestone is red. The lower portion is noncherty, whereas the upper portion contains layers of grayish chert. The total thickness of the formation in the county ranges from 20 to 45 feet (MGS 1961). In the site vicinity, the formation is approximately 70 feet thick (MDNR Undated).

The Compton-Chouteau Fm. consists of finely crystalline to sublithographic, finely bedded crinoidal limestone. The beds are separated by green shale partings. Some portions of the formation are dolomitic and contains bluish-gray to bluish-black chert. In east-central Missouri, this formation merges with the overlying Sedalia Formation and the combined formation is referred to as the undifferentialated Chouteau. The formation is relatively thin in the thickness in east-central Missouri, ranging from 6 to 12 feet (MGS 1961). However, near the site vicinity, the formation is approximately 85 feet thick (MDNR Undated).

Beneath the Mississippian-age formations in the site vicinity is a layer of undifferential Silurian-aged rocks. This unit is approximately 95 feet thick in the site area and consists primarily of cherty limestone (MDNR Undated).

Below the undifferential Silurian-aged rocks are the formations of the Ordovician System. The first formation, encountered below the site in the Ordovician System is the Maquoketa Shale Formation (MDNR Undated). This formation consists of thinly laminated, silty, calcareous or dolomitic shale with nodular and shaly lenses of limestone. The thickness ranges from 30 to 140 feet (MGS 1961). Near the site vicinity, the formation is approximately 115 feet (MDNR Undated). The next formation encountered below the site is the Kimmswick Formation. This formation consists of coarsely crystalline, white to light gray, medium bedded to massive limestone. Chert is irrregularly scattered throughout the formation. The foramtion ranges from 50 to 150 feet thick (MGS 1961). In the site vicinity, the formation is approximately 90 feet thick (MDNR Undated).

The Decorah Fm. lies below the Kimmswick formation in the site vicinity and consists of green and brown shales and interbedded limestone. The upper portion contains medium to thinly bedded, fossiliferous limestone with thin shale partings. The lower portion contains more shale with numerous, thin interbedded limestone. The formation varies in thickness from a few feet to more than 40 feet (MGS 1961). Near the site, the formation thickness is approximately 10 feet (MDNR Undated).

The Plattin Fm. underlies the Decorah Fm. near the site and consists of evenly bedded, dark gray, finely crystalline to sublithographic limestone. The formation also contains minor amounts of intercalated shale, and white chert nodules and layers are present throughout most of the formation. All of the formation in east-central Missouri is composed of dolomite. The formation can be as much as 450 feet thick north and west of Cape Girardeau County (MGS 1961). Near the site, the approximate thickness is 175 feet (MDNR Undated).

The Joachim Fm. lies below the Plattin Fm. in the site area and consists of yellowish-brown, argillaceaous dolomite which contains interbedded limestone and shale in this lower part (MGS 1961). Near the

site, the thickness of this formation is approximately 175 feet (MDNR Undated).

Below the Joachim Fm. in the site area, and the last formation to be discussed in this report is the St. Peter Sandstone Formation. This formation consist primarily of quartzose sandstone. The thickness of the formation is variable, ranging from less than 10 feet to more than 100 feet (MGS 1961).

Because there is an abundance of potable surface water in the site vicinity, ground water is not utilized as a source of drinking water. Generally, the bedrock aquifers of the region yield very small quantities of water; roughly 0 to 50 gallons per minute (gpm). The alluvial aquifers of Quaternary Age that lie along the Meramac, Mississippi, and the Missouri Rivers have much greater yields. Ground water flow in the area is generally to the south and east. The depth to the water table varies because of the variability in the depth of fill material. Generally, the water table is about two feet above the Mississippi River (Vandike 1990).

The bedrock aquifers in the region are divided into five discrete units, or groups. Group one, the Post-Maquoketa group, includes the strata above the Kimmswick Formation to the surface. Below this aquifer group lies the Maquoketa Shale, which is believed to act as an aquitard. Group two is the Ordovician-age Kimmswick-Joachim aquifer. Near the top of this unit is the Decorah Formation, which probably acts as a confining bed composed of shales and interbedded limestones. The remaining lower three aquifers are, in descending order: the St. Peter-Everton, Powell-Gascondade, and the Eminence-Lamotte. These units are separated primarily on the basis of unconformities, and are likely to be hydraulically connected. These deeper bedrock aquifers can be seen in Figure 5-4 and 5-5, which depict generalized hydrogeology of St. Louis County.

The migration of coal tar in ground water has been observed in several former coal gas manufacturing sites (Environmental Research 1984, E & E/FIT 1987). Coal tar is more dense than water and tends to migrate downward through porous material to a confining layer of less porous material. In areas where this behavior is exhibited, the following stratification (from top to bottom) may be expected: ground water with

System	Series	Group	Formation	Aquifer group	Thickness (feet)	Dominant lithology	Water-bearing character
Quaternary	Holocene		Alluvium[1]		0-150	Sand, gravel, silt, and clay.	Some wells yield more than 2,000 gpm.
	Pleistocene		Loess		0-110	Silt	
			Glacial till		0-55	Pebbly clay and silt.	Essentially not water yielding
Pennsylvanian	Missourian	Pleasanton	Undifferentiated		0-75	Shales, siltstones, "dirty" sandstones, coal beds and thin limestone beds.	Generally yields very small quantities of water to wells. Yields range from 0-10 gpm.
		Marmaton	Undifferentiated		0-90		
	Desmoinesian	Cherokee	Undifferentiated		0-200		
	Atokan		Undifferentiated				
Mississippian	Meramecian		Ste. Genevieve Formation		0-160	Argillaceous to arenaceous limestone.	
			St. Louis Limestone		0-180		
			Salem Formation		0-180		
			Warsaw Formation		0-110		
	Osagean		Burlington-Keokuk Limestone	1	0-240	Cherty limestone	
			Fern Glen Formation		0-105	Red limestone and shale	Yields small to moderate quantities of water to wells. Yields range from 5 to 50 gpm. Higher yields are reported for this interval locally.
	Kinderhookian	Chouteau	Undifferentiated		0-122	Limestone, dolomitic limestone, shale, and siltstone.	
Devonian	Upper	Sulphur Springs	Bushberg Sandstone		0-60	Limestone and sandstone.	
			Glen Park Limestone				
			Grassy Creek Shale		0-50	Fissile, carbonaceous shale.	
Silurian			Undifferentiated		0-200	Cherty limestone.	
Ordovician	Cincinnatian		Maquoketa Shale		0-163	Silty, calcareous or dolomitic shale.	Probably constitutes a confining influence on water movement.
			Cape Limestone		0-5	Argillaceous limestone.	
	Champlainian		Kimmswick Formation		0-145	Massive limestone	Yields small to moderate quantities of water to wells. Yields range from 5 to 50 gpm. Decorah Formation probably acts as a confining bed locally.
			Decorah Formation		0-50	Shale with interbedded limestone.	
			Plattin Formation	2	0-240	Finely crystalline limestone.	
			Rock Levee Formation		0-93	Dolomite and limestone, some shale.	
			Joachim Dolomite		0-135	Primarily argillaceous dolomite.	
			St. Peter Sandstone		0-160	Silty sandstone, cherty limestone grading upward into quartzose sandstone.	Yields moderate quantities of water to wells. Yields range from 10-140 gpm.
			Everton Formation	3	0-130		
	Canadian		Powell Dolomite		0-150	Sandy and cherty dolomites and sandstone.	Yields small to large quantities of water to wells. Yields range from 10 to 300 gpm. Upper part of aquifer group yields only small amounts of water to wells.
			Cotter Dolomite		0-320		
			Jefferson City Dolomite	4	0-225		
			Roubidoux Formation		0-177		
			Gasconade Dolomite Gunter Sandstone Member		0-280		
Cambrian	Upper		Eminence Dolomite		0-172	Cherty dolomites, siltstones, sandstone, and shale.	Yields moderate to large quantities of water to wells. Yields range from 10 to 400 gpm.
			Potosi Dolomite		0-325		
		Elvins	Derby-Doerun Dolomite	5	0-165		
			Davis Formation		0-150		
			Bonneterre Formation		243-385		
			Lamotte Sandstone		235+		
Precambrian						Igneous and metamorphic rocks.	Does not yield water to wells in this area.

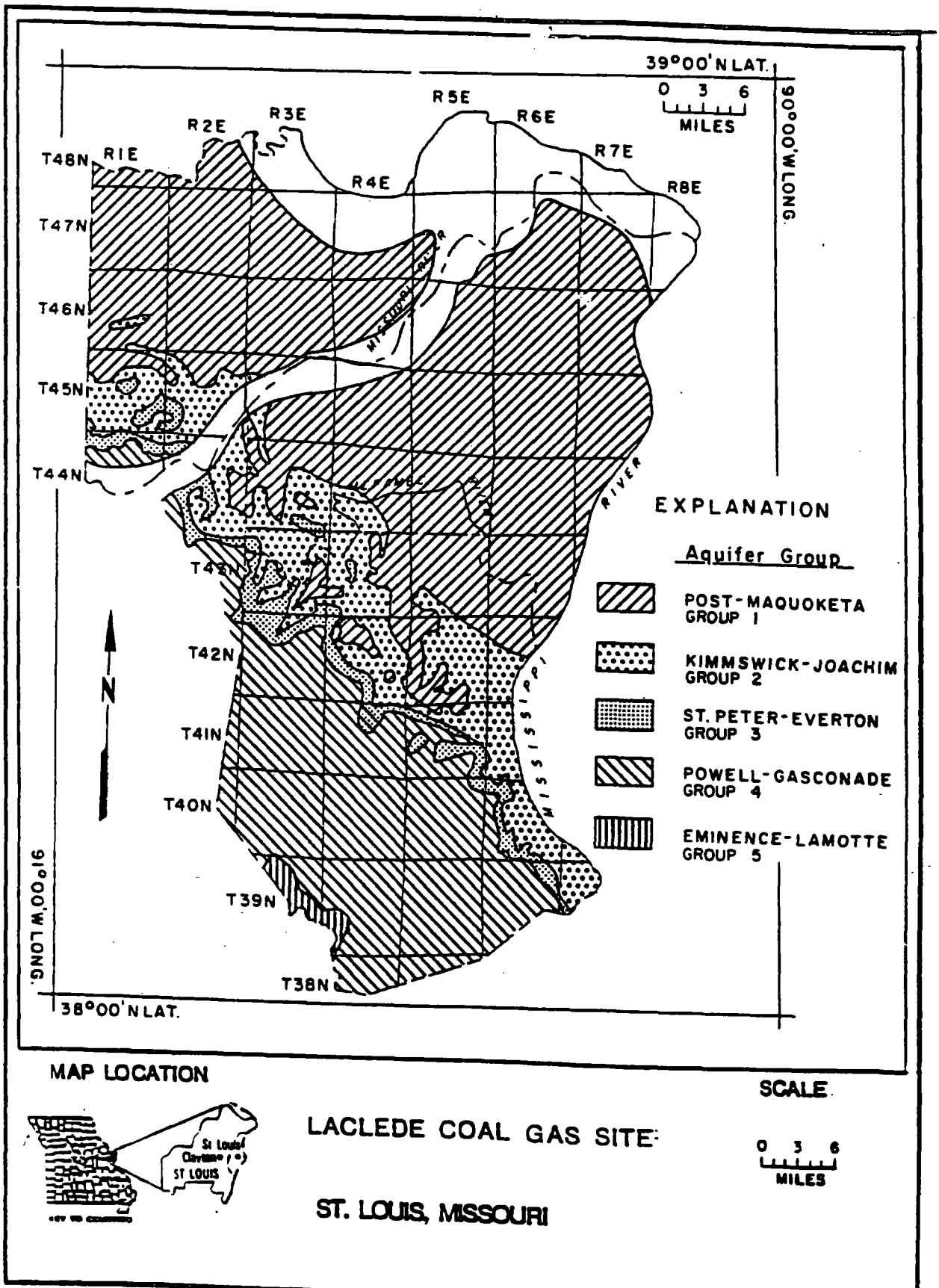
LACLEDE COAL GAS SITE

ST. LOUIS, MISSOURI

WASTE SITE TRACKING NO.: MO0579
PREPARED BY: JOHN C. PARKS

ECOLOGY AND ENVIRONMENT FIT DEC. 1987
Source: MGSWR 1974

FIGURE 5-4 : GENERALIZED HYDROGEOLOGIC SECTION ST. LOUIS COUNTY MISSOURI



WASTE SITE TRACKING NO.: MO0579
PREPARED BY: JOHN C. PARKS

ECOLOGY AND ENVIRONMENT FIT DEC. 1987
Source: MGSWR 1974

FIGURE 5-5 : MAJOR AQUIFER DISTRIBUTION ST. LOUIS COUNTY MISSOURI.

dissolved organics; ground water with trapped coal tar; and below the confining layer, ground water with dissolved organics.

5.5 TARGETS

The drinking water needs of the city and surrounding community are provided primarily through the withdrawal of surface water from intakes on the Missouri, Mississippi, and Meramac Rivers. Withdrawal from these rivers total nearly 1.12 by 10^9 gallons per day (City of St. Louis, Undated). The municipal water intakes for the city of St. Louis and surrounding communities are approximately nine miles upstream from the site (MGS 1974). The combined flow from the Missouri and Mississippi Rivers averages approximately 1.12 by 10^{10} gallons per day. The Meramac has an average flow of 1.92×10^9 gallons per day. The municipal intake for the community of Illinois Metro East is located at mile marker 180.8, almost directly across the Mississippi River, about 1/4 mile east of the site (Figure 2-1). About 300,000 residents are served by this water supply. Illinois American Water Company draws approximately 15 to 20 million gallons per day from this intake during the winter months; withdrawal rates in the summary are much higher (Schlosser 1990). This is the only drinking water intake within 15 miles downstream of the site. Various industries have intakes on the Mississippi River, but their use is industrial.

According to the Missouri Department of Conservation, it is not likely that any sensitive environment or critical habitats occur within 15 miles downstream of the site. The possible exception is the Sicklefin Chub, (Hybopsis meek), which occurred in the Mississippi River in 1944 and may still occur in the area (Dickneite 1991).

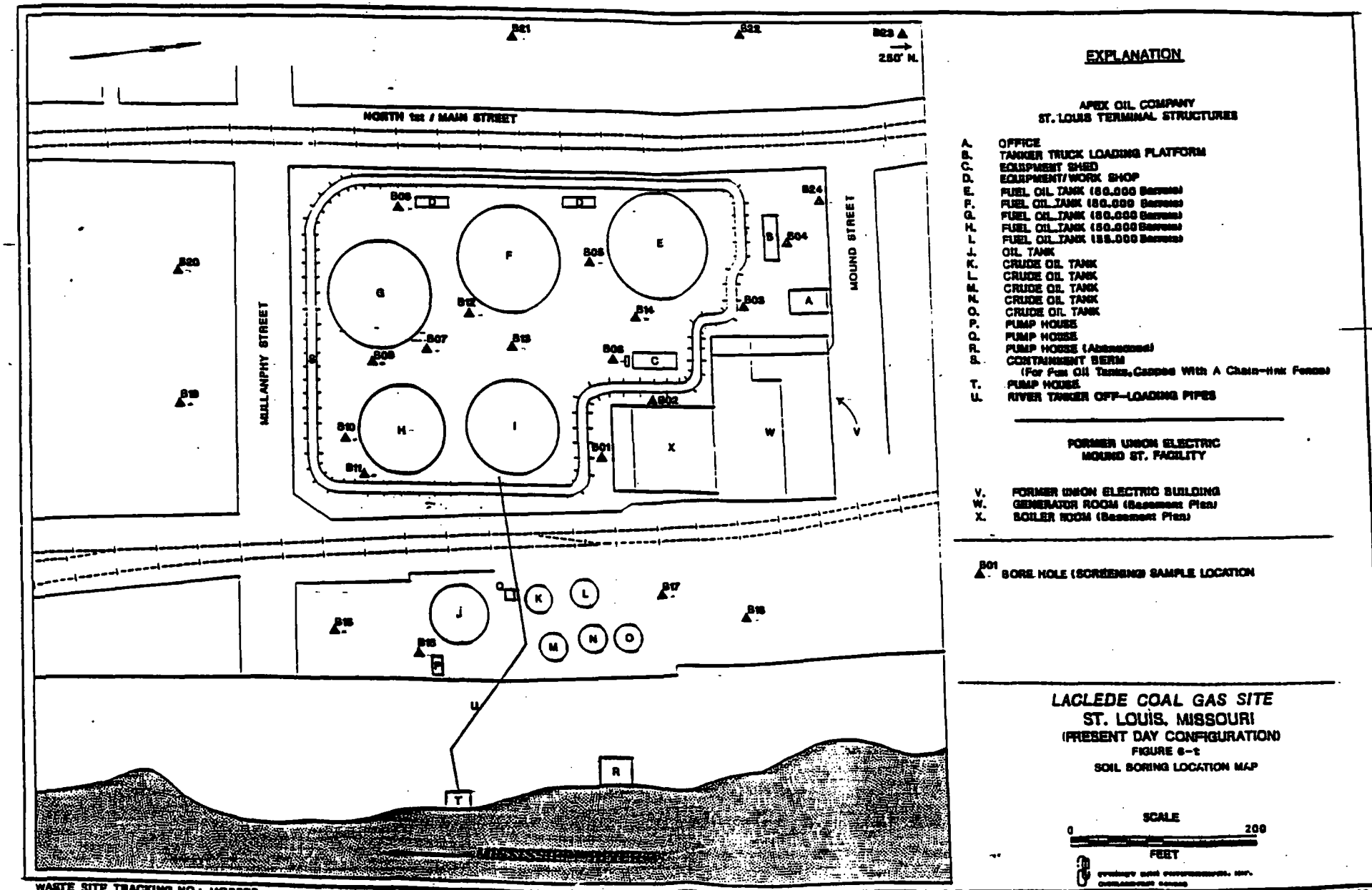
SECTION 6: FIELD ACTIVITIES

Field work was conducted March 3 through 9, 1991. The sample series assigned to this activity was DSX44. The FIT members and their respective tasks were: Keith Brown, Team Leader; Anne Melia, FASP coordinator; Chris Williams, Geoprobe operator and sampler; Patty Roberts, Assistant Geoprobe operator and sampler; Wes McCall, drilling supervisor and Site Safety Officer; John Peck, sampler and health and safety monitor; and Jon Strobel, sampler and assistant FASP coordinator. The FIT contracted John Mathes & Associates, Inc. to conduct all subsurface drilling. On-site personnel for John Mathes & Associates, Inc. were: Keith Bunselmyer, driller; and Jeff Crank and Jim Burker, driller's assistants. Additionally, William Oberle and Jacalyn Wheeler, E & E/FIT, were present on site March 6 and 7, 1991, to conduct a health and safety, and technical field audits.

The primary chemical hazards associated with the Laclede Coal Gas site involve soils contaminated with cyanide salts and/or PAHs. These materials could pose inhalation, direct contact, and ingestion hazards. Samples were collected in level-D and level-C personal protection. An HNu photo-ionization detector with 10.2 eV probe was used to monitor ambient levels of volatile compounds in the breathing zone. If the HNu registered readings above predetermined action levels, personal protection was upgraded to level-C. Otherwise, samples were collected in level-D personal protection.

6.1 SUBSURFACE SOIL SAMPLING

Subsurface soil sampling was conducted March 4 through 9, in an attempt to determine the areal and vertical extent of subsurface contamination. Initially, 24 locations were drilled with solid stem augers (Figure 6-1; Table 6-1). Their depths ranged from 2 feet to 38 feet. Originally, the work plan called for 18 locations to be drilled with solid stem augers to approximately 20 foot depths, with the exception of 1 location which was to be drilled to 50 feet deep. This deep sample was intended to determine the depth to bedrock and help assess the vertical contaminant zone. The 6 additional locations were added because subsurface rubble prohibited the advancement of the augers



EXPLANATION

APEX OIL COMPANY
ST. LOUIS TERMINAL STRUCTURES

A. OFFICE
B. TANKER TRUCK LOADING PLATFORM
C. EQUIPMENT SHED
D. EQUIPMENT/WORK SHOP
E. FUEL OIL TANK (80,000 Barrels)
F. FUEL OIL TANK (80,000 Barrels)
G. FUEL OIL TANK (80,000 Barrels)
H. FUEL OIL TANK (50,000 Barrels)
I. FUEL OIL TANK (55,000 Barrels)
J. OIL TANK
K. CRUDE OIL TANK
L. CRUDE OIL TANK
M. CRUDE OIL TANK
N. CRUDE OIL TANK
O. CRUDE OIL TANK
P. PUMP HOUSE
Q. PUMP HOUSE
R. PUMP HOUSE (Abandoned)
S. CONTAINMENT BERM
(For Fuel Oil Tanks, Capped With A Chain-link Fence)
T. PUMP HOUSE
U. RIVER TANKER OFF-LOADING PIPES

FORMER UNION ELECTRIC
MOUND ST. FACILITY

V. FORMER UNION ELECTRIC BUILDING
W. GENERATOR ROOM (Basement Plan)
X. BOILER ROOM (Basement Plan)

B01 BORE HOLE (SCREENING) SAMPLE LOCATION

LACLEDE COAL GAS SITE
ST. LOUIS, MISSOURI
(PRESENT DAY CONFIGURATION)
FIGURE 6-2
SOIL BORING LOCATION MAP

SCALE
0 200
FEET

WASTE SITE TRACKING NO.: MO0579
PREPARED BY: K. BROWN

FIT MAY 1991

Table 6-1
Borehole Summary
Laclede Coal Gas
St. Louis, Missouri
Sample Series DSX44
March 1991

Borehole #	Depth (ft)	Approximate Location
B01	18	South of former Mound Street Power Plant
B02	21	Southwest of former Mound Street Power Plant
B03	19	South of P, F, & T Office
B04	19	North of tanker truck loading platform
B05	26	Approximately 15 feet south of northern-most fuel oil tank
B06	38	North of center of site within containment berm
B07	29	South of center of site within containment berm
B08	--	Southwest corner of site within containment berm
B09	--	South of center of site within containment berm
B10	--	Southeast corner of site within containment berm
B11	15	Southeast corner of site within containment berm
B12	11	Center of site within containment berm
B13	10	Center of site within containment berm
B14	26	North center of site within containment berm
B15	31	Southeast corner of site
B16		Southeast corner of site approximately 100 feet north of B15
B17	33	Northeast corner of site
B18	33	Northeast corner of site approximately 150 north of B17
B19	30	South of Mullanphy Street
B20	30	South of Mullanphy Street approximately 200 feet north of B19
B21	--	Approximately 80 feet north of North 1st Street
B22	--	Approximately 300 feet north of B21
B23	--	Approximately 450 feet north of B22
B24	23	Northeast corner of site

Note: See Figure 6-1 for borehole locations.

at several locations to only a few feet and, therefore, a representative sample could not be collected.

Samples were collected off the auger flights and screened on site for PAHs and VOCs in the FASP mobile laboratory (Tables 6-2 and 6-3). The samples were collected at 5 foot intervals: the PAH sample was a composite of 5 aliquots, 1 collected every foot; the VOC sample was a grab sample. Four of the sample locations determined by FASP analysis to be the most contaminated were resampled as follows: hollow stem augers equipped with continuous samplers were advanced, offset 1 to 5 feet from the screening boring (Figure 6-2, Table 6-4). A background location was sampled in the same manner. Due to subsurface rubble and debris, the continuous sampler could not be utilized at all locations. A split spoon sampler equipped with a 140 pound hammer was used at locations where the continuous sampler would not work. Samples were collected according to E & E, Inc. Standard Operation Procedures (SOPs) for borehole sampling, Gentech 5.9. Samples from the 4 locations that were resampled were submitted to EPA for volatiles, semi-volatiles, cyanides, and total metals analysis.

The background samples were inadvertently discarded along with the screening samples. This was not discovered by FIT until the SSI was completed and the team had returned to Kansas City. Split samples had been collected at all locations where samples were submitted to the EPA and which were also on PF & T property. Kathy Enright, of E & E/TAT in St. Louis, Missouri, sent the split samples collected for PF & T to E & E's Kansas City office. These samples were once again split, and 1 set was submitted to EPA to be used as the background sample. The other set was returned to PF & T.

The background samples were collected at a different location than stated in the work plan because bedrock was encountered at approximately 2 feet below the surface at this location; therefore, subsurface soil samples could not be collected there. FASP analysis had revealed that borehole #B24, the farthest upgradient screening sample, was below detection limits for all target compounds. It was known that the depth to bedrock was approximately 20 feet. Therefore, E & E/FIT relocated

Table 6-2
FASP Screening Results for Volatiles
LaClede Coal Gas
St. Louis, Missouri
Sample Series DSX44
March 1991

Sample #	Benzene (µg/kg)	Toluene (µg/kg)	M-xylene (µg/kg)	Depth (feet)
B01 A	1,200	380	1,700	0 - 5
B01 B	9,100	1,200	19,000	5 - 10
B01 C	18,000	710	65,000	10 - 15
B01 D	17,000	770	79,000	15 - 18
B02 A	6,300	43,000	240,000	0 - 5
B02 B	6,100	1,700	57,000	5 - 10
B02 C	69,000	110,000	570,000	10 - 15
B02 D	7,500	650	33,000	15 - 21
B03 A	1,040	22,000	22,000	0 - 5
B03 B	310	11,000	53,000	5 - 10
B03 C	1,800	6,300	3,500	10 - 15
B03 D	860	9,000	5,300	15 - 19
B04 A	< 250	450	5,600	0 - 5
B04 B	310	480	5,900	5 - 10
B04 C	< 250	250	5,100	10 - 15
B04 D	< 250	ND	440	15 - 19
B05 A	460	ND	ND	0 - 5
B05 B	ND	ND	ND	5 - 10
B05 C	ND	ND	420	10 - 15
B05 D	ND	ND	410	15 - 20
B05 E	ND	ND	ND	20 - 26
B06 A	48,000	1,700	120,000	0 - 5
B06 B	20,000	1,800	68,000	8 - 10
B06 BA	93,000	120,000	220,000	0 - 5
B06 BB	27,000	91,000	260,000	5 - 10
B06 BC	ND	ND	ND	10 - 15
B06 BD	< 250	< 250	ND	15 - 20
B06 BE	12,000	14,000	54,000	20 - 25
B06 BF	43,000	66,000	23,000	25 - 30
B06 BG	20,000	16,000	26,000	30 - 35
B06 BH	29,000	43,000	94,000	35 - 38
B07 A	1,000,000	17,000	2,500,000	3 - 8
B07 B	670,000	12,000	2,100,000	8 - 13
B07 C	370,000	ND	> 1,200,000	13 - 18
B07 D	140,000	2,500	> 21,000,000	18 - 23
B07 E	22,000	490	120,000	23 - 26
B07 F	51,000	2,800	340,000	26 - 29
B10 B	< 250	410	ND	5 - 10
B11 A	ND	ND	ND	0 - 5

Table 6-2 (cont.)

Sample #	Benzene (µg/kg)	Toluene (µg/kg)	M-xylene (µg/kg)	Depth (feet)
B11 B	ND	ND	ND	5 - 10
B11 C	ND	ND	ND	10 - 15
B12 A	< 250	< 250	1,500	0 - 5
B12 B	910	1,600	4,400	5 - 11
B13 A	570	420	< 250	0 - 5
B13 B	670	450	2,300	5 - 10
B14 A	270,000	11,000	> 160,000	2 - 8
B14 B	790	9,100	> 24,000	8 - 13
B14 C	400,000	14,000	> 160,000	13 - 18
B14 D	340,000	12,000	> 210,000	18 - 23
B14 E	310,000	8,900	> 195,000	23 - 26
B14 F	2,200,000	63,000	> 1,000,000	---
B14 SS	93,000	110,000	440,000	---
B15 A	680	490	> 29,000	0 - 5
B15 B	290	ND	10,000	5 - 10
B15 C	< 250	ND	7,400	10 - 15
B15 D	< 250	ND	2,700	15 - 20
B15 E	ND	ND	ND	20 - 25
B15 F	ND	ND	ND	25 - 31
B16 A	820	860	15,000	0 - 3
B17 A	540	ND	21,000	0 - 5
B17 B	ND	ND	2,700	5 - 10
B17 C	ND	ND	ND	10 - 15
B17 D	ND	ND	ND	15 - 20
B17 E	ND	ND	ND	20 - 25
B17 F	ND	ND	ND	25 - 30
B17 G	ND	ND	ND	30 - 33
B18 A	< 250	ND	ND	0 - 5
B18 B	ND	ND	ND	5 - 10
B18 C	ND	ND	ND	10 - 15
B18 D	ND	ND	ND	15 - 20
B18 E	ND	ND	ND	20 - 25
B18 F	ND	ND	ND	25 - 30
B18 G	ND	ND	ND	30 - 33
B19 A	ND	ND	ND	0 - 5
B19 B	ND	ND	ND	5 - 10
B19 C	ND	ND	ND	10 - 15
B19 D	ND	ND	ND	15 - 20
B19 E	ND	ND	ND	20 - 25
B19 F	ND	ND	ND	25 - 30
B20 A	320	ND	ND	0 - 5
B20 B	ND	ND	ND	5 - 10
B20 C	ND	ND	ND	10 - 15
B20 D	ND	ND	ND	15 - 20

Table 6-2 (cont.)

Sample #	Benzene (µg/kg)	Toluene (µg/kg)	M-xylene (µg/kg)	Depth (feet)
B20 E	ND	ND	ND	20 - 25
B20 F	ND	ND	ND	25 - 30
B22 A	ND	ND	ND	---
B23 A	ND	ND	ND	0 - 4
B24 A	ND	ND	ND	0 - 5
B24 B	ND	ND	ND	5 - 10
B24 C	< 250	ND	ND	10 - 15
B24 D	400	ND	550	15 - 20
B24 E	460	ND	430	20 - 23
401	ND	ND	ND	N/A
402	ND	ND	1,600	N/A
403	< 250	< 250	420	N/A
301	ND	ND	ND	N/A
302	ND	ND	ND	N/A
303	ND	ND	ND	N/A
304	ND	ND	ND	N/A
DW 1	188	77	1,000	N/A
DW 2	330	48	1,100	N/A
CDW	ND	ND	ND	N/A
SS-Rinsate	ND	ND	ND	N/A

Note: Detection limit for soil/sediment samples = 250 µg/kg. Detection limit for water samples = 25 µg/L. See Figures 6-1 and 6-2 for sample locations.

B01 A through B24 E = soil samples
401 through 403 = sediment samples
301 through 304 = surface water samples
DW = decon water (units are µg/L)
CDW = clean decon water
ND = no detection
N/A = not applicable
SS = split spoon

Table 6-3
FASP Screening Results for PAHs
LaClede Coal Gas
St. Louis, Missouri
Sample Series DSX44
March 1991
Reported in µg/kg

Sample #	Fluor-anthene	Pyrene	Benzo(k) fluoranthene	Benzo(a) pyrene	Comments
B01 A	16,000	3,700	NA	NA	
B01 B	27,000	12,000	NA	NA	
B01 C	56,000	40,000	NA	NA	
B01 D	13,000	5,200	NA	NA	
B02 A	8,000	ND	ND	ND	
B02 B	15,000	ND	ND	ND	
B02 C	ND	ND	ND	ND	
B02 D	ND	ND	ND	ND	
B03 A	ND	ND	ND	ND	
B03 B	ND	ND	ND	ND	
B03 C	ND	ND	ND	ND	
B03 D	ND	ND	ND	ND	
B04 A	ND	ND	ND	ND	
B04 B	12,000	ND	ND	ND	
B04 C	9,000	ND	ND	ND	
B04 D	< 500	ND	ND	ND	chyrsene & benzo(a) anthracene = 1,200
B05 A	ND	ND	ND	ND	
B05 B	ND	ND	ND	ND	
B05 C	ND	ND	ND	ND	
B05 D	ND	ND	ND	ND	two unknown peaks
B05 E	ND	ND	ND	ND	
B06 A	55,000	110,000	54,000	40,000	anaphthalene, fluorene, anthracene, chrysene
B06 B	Blew out GC, peaks too large to integrate				
B06 BA	ND	ND	ND	ND	
B06 BB	ND	ND	ND	ND	
B06 BC	ND	ND	32,000	11,000	other identified peaks
B06 BD	ND	ND	ND	ND	
B06 BE	ND	ND	ND	ND	
B06 BF	ND	ND	ND	ND	
B06 BG	ND	ND	ND	ND	
B06 BH	17,000	ND	ND	ND	
B07 A	Peaks too large to integrate, no time to reanalyze				
B07 B	160,000	50,000	50,000	70,000	other PAHs present
B07 C	130,000	130,000	33,000	76,000	other PAHs present
B07 D	12,000	9,600	3,700	3,900	
B07 E	3,300	3,800	3,500	3,000	other PAHs present
B07 F	20,000	19,000	4,200	8,000	other PAHs present
B10 B	14,000	16,000	7,800	9,100	other PAHs present

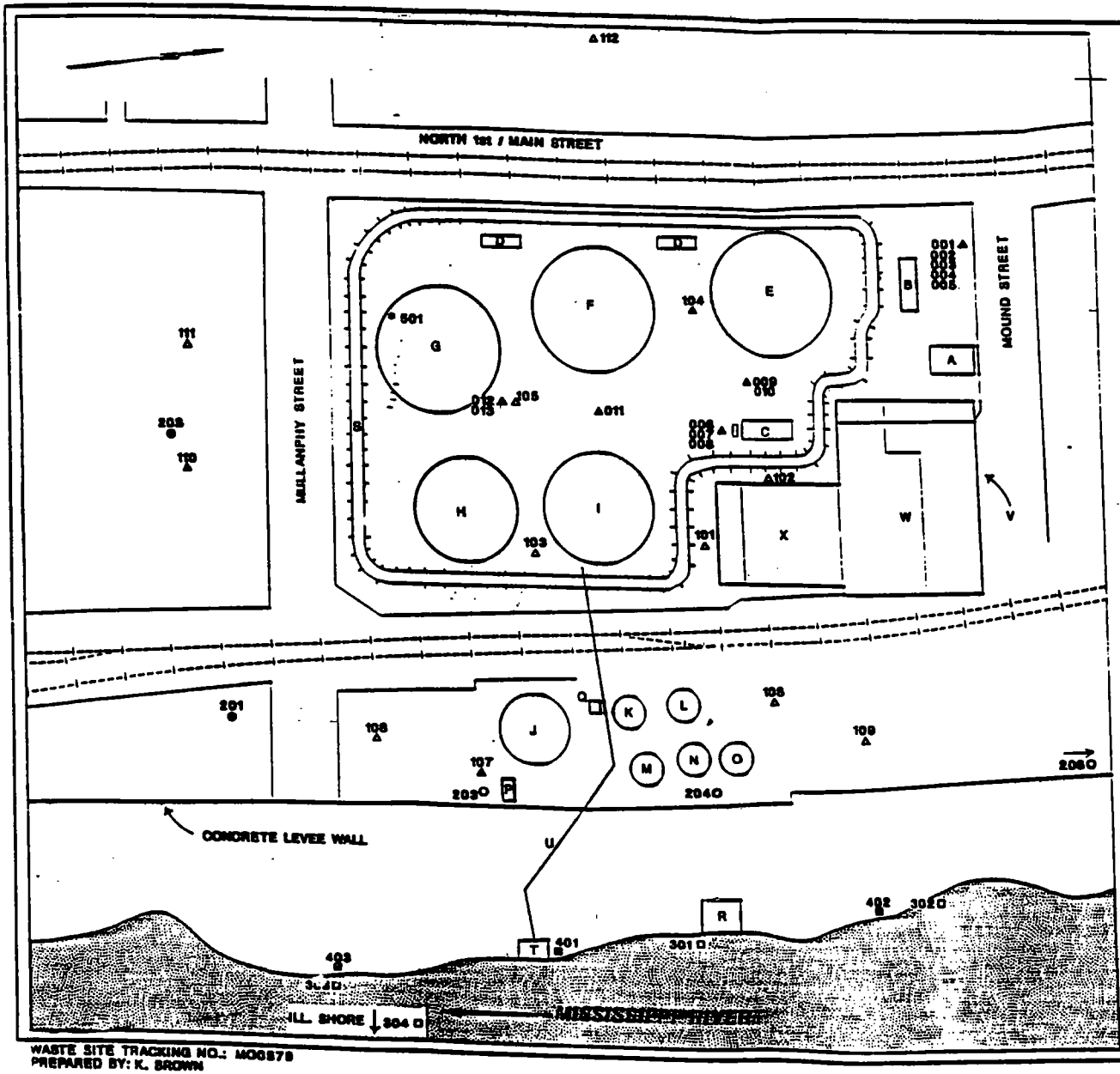
Table 6-3 (cont.)

B11 A	2,400	1,600	4,200	ND	other PAHs present
B11 B	?,100	2,100	7,000	10,000	other PAHs present
B11 C	7,800	ND	6,000	12,000	
B12 A	14,000	12,000	14,000	15,000	
B12 B	38,000	29,000	12,000	15,000	
B13 A	150,000	73,000	46,000	44,000	
B13 B	12,000	10,000	10,000	12,000	
B13 C	32,000	34,000	28,000	32,000	
B14 A	1,600,000	580,000	280,000	63,000	other identified peak
B14 B	2,200,000	1,000,000	370,000	310,000	other identified peak
B14 C	4,200,000	1,600,000	1,200,000		other identified peak
B14 D	4,300,000	1,300,000	490,000		other identified peak
B14 E	3,200,000	4,100,000	1,500,000	140,000	other identified peak
B14 F	Blew out GC, peaks too large to integrate				
B14 SS	1,400,000	880,000	230,000	130,000	
B15 A	ND	ND	ND	ND	
B15 B	4,900	1,300	ND	ND	
B15 C	ND	ND	ND	ND	
B15 D	ND	ND	ND	ND	
B15 E	ND	ND	ND	ND	
B15 F	ND	ND	ND	ND	
B16 A	19,000	30,000	ND	ND	early peaks
B17 A	ND	ND	ND	ND	
B17 B	ND	ND	ND	ND	
B17 C	ND	< 500	ND	ND	
B17 D	ND	ND	ND	ND	
B17 E	ND	ND	ND	ND	
B17 F	ND	ND	ND	ND	
B18 A	ND	ND	ND	ND	
B18 B	ND	ND	ND	ND	
B18 C	ND	ND	ND	ND	
B18 D	ND	ND	ND	ND	
B18 E	ND	ND	ND	ND	
B18 F	ND	ND	ND	ND	
B18 G	ND	ND	ND	ND	
B19 A	ND	ND	ND	ND	
B19 B	ND	ND	ND	ND	
B19 C	ND	ND	ND	ND	
B19 D	ND	ND	ND	ND	
B19 E	18,000	16,000	14,000	12,000	
B19 F	4,500	ND	2,800	ND	
B20 A	ND	2,900	< 500	ND	
B20 B	4,100	4,000	ND	545	
B20 C	ND	ND	ND	ND	
B20 D	ND	ND	ND	ND	
B20 E	ND	ND	ND	ND	
B20 F	2,600	3,200	3,500	4,500	
B22 A	3,800	3,500	2,800	ND	

Table 6-3 (cont.)

B23 A	ND	ND	ND	ND	
501	--	--	--	--	peaks close to retention time, but do not match
402	ND	ND	ND	ND	
403	2,600	5,400	4,200	3,800	
DDW	ND	ND	ND	ND	no peaks (µg/L)
SS Rinsate	ND	ND	ND	ND	no peaks (µg/L)
B24 A	ND	ND	ND	ND	
B24 B	ND	ND	ND	ND	
B24 C	ND	ND	ND	ND	
B24 D	ND	ND	ND	ND	
B24 E	ND	ND	ND	ND	

Note: Sample locations are shown on Figures 6-1 and 6-2. Sample 501 is an oil sample collected from tank #7, shown on Figure 6-2. Detection limits for soil/sediment = 500 µg/kg. Detection limits for water samples = 15 µg/l.
DDW = dirty decon water
SS = split spoon
NA = not analyzed
ND = not detected



EXPLANATION

APEX OIL COMPANY
ST. LOUIS TERMINAL STRUCTURES

- A. OFFICE
- B. TANKER TRUCK LOADING PLATFORM
- C. EQUIPMENT SHED
- D. EQUIPMENT/WORK SHOP
- E. FUEL OIL TANK (60,000 Barrels)
- F. FUEL OIL TANK (60,000 Barrels)
- G. FUEL OIL TANK (80,000 Barrels)
- H. FUEL OIL TANK (50,000 Barrels)
- I. FUEL OIL TANK (55,000 Barrels)
- J. OIL TANK
- K. CRUDE OIL TANK
- L. CRUDE OIL TANK
- M. CRUDE OIL TANK
- N. CRUDE OIL TANK
- O. CRUDE OIL TANK
- P. PUMP HOUSE
- Q. PUMP HOUSE
- R. PUMP HOUSE (Abandoned)
- S. CONTAINMENT BERM
  (For Fuel Oil Tanks, Canvas With A Chain-link Fence)
- T. PUMP HOUSE
- U. RIVER TANKER OFF-LOADING PIPES

FORMER UNION ELECTRIC
MOUND ST. FACILITY

- V. FORMER UNION ELECTRIC BUILDING
- W. GENERATOR ROOM (Basement Plan)
- X. BOILER ROOM (Basement Plan)

- ▲ SUBSURFACE SOIL SAMPLE LOCATION
- △ SURFACE SOIL SAMPLE LOCATION
- ● MINI WELL SAMPLE LOCATION
- ○ PIEZOMETER WELL SAMPLE LOCATION
- □ SURFACE WATER SAMPLE LOCATION
- ■ SEDIMENT SAMPLE LOCATION
- • HIGH CONCENTRATION OIL SAMPLE LOCATION

LACLEDE COAL GAS SITE
ST. LOUIS, MISSOURI
(PRESENT DAY CONFIGURATION)

SAMPLE SERIES # DSX44

SAMPLING DATES: MAR. 4-8, 1991

FIGURE 6-2

SCALE

0 200

FEET

WASTE SITE TRACKING NO.: MO0579
PREPARED BY: K. BROWN

FIT

Table 6-4
CLP Soil/Sediment Sample Summary
LaClede Coal Gas
St. Louis, Missouri
Sample Series DSX44
March 1991

Sample #	Depth (feet)	Location Description
001	3 - 7	5 feet northwest of B24
002	7 - 11	5 feet northwest of B24
003	11 - 15	5 feet northwest of B24
004	15 - 19	5 feet northwest of B24
005	19 - 23	5 feet northwest of B24
006	3 - 8	2.5 feet north of B06
007	8 - 13	2.5 feet north of B06
008	8 - 12	2 feet south of B06
009	4 - 8	3 feet northwest of B14
010	12 - 14	3 feet northwest of B14
011	11 - 17	1.5 feet west of B07
012	5 - 11	1 foot north of B13
013	11 - 12.5	1 foot north of B13
101	0 - 2	B01
102	0 - 2	B02
103	0 - 2	South central tank farm
104	0 - 2	B05
105	0 - 2	B07
106	0 - 2	B15
107	0 - 2	B16
108	0 - 2	B17
109	0 - 2	B18
110	0 - 2	B19
111	0 - 2	B20
112	0 - 2	B21
401	N/A	150 feet south of southeast corner of the abandoned pump house
401D	N/A	150 feet south of southeast corner of the abandoned pump house
402	N/A	110 feet north of northeast corner of the abandoned pump house
403	N/A	330 feet south of southeast corner of the abandoned pump house

Note: Samples 001 through 013 collected from five aliquots, except VOCs were grab samples. Samples 101 through 112 collected from two aliquots. All samples were submitted to EPA for cyanide, semi-volatiles, and total metals analyses. Samples 001 through 113 and 401 through 403 were also analyzed for volatiles. Samples 401 through 403 were also analyzed for total petroleum hydrocarbons. See Figure 6-2 for sample locations.
D = Duplicate
N/A = Not applicable

the background sample location to the farthest northwest corner of PF & T property. This location is approximately 60 feet northwest (upgradient) of borehole #B04 (Figure 6-1).

6.2 SURFACE SOIL SAMPLING

Surface soil sampling was conducted March 4 through 7, to determine whether contamination was present in the 0- to 2-foot interval. Twelve samples were collected (Figure 6-2, Table 6-4). According to the work plan, these samples were to be collected using a power auger. However, due to excessive amounts of gravel and rubble present, the power auger could not be used efficiently. Therefore, all but one surface soil sample was collected with the subcontractor's drill rig.

Each sample was collected off the auger flights and consisted of two aliquots collected from one- and two-foot depths. The sample not collected with the drill rig was obtained with the use of the power auger. Three of the 12 surface soil samples collected, 110, 111, and 112, were inadvertently discarded along with the screening samples. Keith Brown and Scott Hayes returned to the site on March 13 and 14 and recollected these samples with a power auger. All samples were submitted to EPA for semi-volatile, cyanide, and total metals analyses. Samples were collected in accordance with the Region VII E & E/FIT SOP for soil sample collection, Geotech 5.17.

6.3 GROUND WATER SAMPLING

Ground water sampling was conducted March 5 through 9, to determine whether any coal tar wastes present have leached into the shallow ground water or migrated off site via the ground water. A total of 9 samples, including a duplicate, field blank, rinsate, and extra volume sample were collected (Figure 6-2, Table 6-5). The work plan called for the installation of 4 temporary mini-wells with the Geoprobe. Due to subsurface rubble, only 2 mini-wells were installed. However, the Corps of Engineers (COE) has installed piezometer wells along the west side of the Mississippi River levee wall. The COE wells located just east of the site were sampled with the use of the Geoprobe vacuum system. One other COE piezometer well was sampled; it is located approximately 1,500 feet north (upgradient) of the site along the levee wall. This location

Table 6-5
Water Sampling Summary
LaClede Coal Gas
St. Louis, Missouri
Sample Series DSX44
March 1991

Sample #	Depth (feet)	Static Water Level (SWL) (feet)	Location/Description
201	26	24	64 feet south from center of Mullanphy Street and 50 feet east of easternmost railroad
202	33	24	147 feet west of easternmost railroad and 78 feet south of center of Mullanphy Street
203	47.25	27.25	147 feet north of center of Mullanphy Street and 40 feet west of levee wall
204	48	26	363 feet north of center of Mullanphy Street and 25 feet west of levee wall
205F	N/A	N/A	Rinsate of augers and split spoon sampler
206	52	29	2,118 feet north of center of Mullanphy Street and 20 feet west of levee wall
206D			Duplicate of 206
207F	N/A	N/A	Field Blank
208	N/A	N/A	Geoprobe pipe rinsate sample
209F	N/A	N/A	Trip blank
301	Surface	N/A	Southeast corner of abandoned pump house
301D	Duplicate of above		
302	Surface	N/A	170 feet north of northeast corner of abandoned pump house
303	Surface	N/A	330 feet south of southeast corner of abandoned pump house
304	Surface	N/A	Illinois American drinking water intake in East St. Louis
304D			Duplicate of 304
501	Surface	N/A	Oil sample collected from PF & T tank #80-1

Note: See legend on next page.

Legend for Table 6-5

Note: Sample locations are shown on Figure 6-2. All water samples were submitted to EPA for volatiles, semi-volatiles, and total and dissolved metals analyses. Samples 301 through 304D were also analyzed for Total Petroleum Hydrocarbons. Sample #501 is an oil sample which was submitted to EPA for Total Petroleum Hydrocarbons, volatiles, and semi-volatiles analyses. Cyanide samples were preserved with sodium hydroxide. Metals samples were preserved with nitric acid.

D = duplicate
F = field blank or trip blank
N/A = not applicable

was chosen for the ground water background sample. The original background location could not be sampled because bedrock was only 2 feet deep. All samples were collected following the E & E Region VII SOP for ground water collection, Gentech 5.11. Total and dissolved metals samples were preserved with nitric acid; cyanide samples were preserved with sodium hydroxide; and all samples were stored on ice. Samples were delivered to EPA for volatiles, semi-volatiles, cyanide, total metals, and dissolved metals analyses. The field parameters, temperature, pH, and conductivity were measured and recorded in the field (Table 6-6).

6.4 SURFACE WATER/SEDIMENT SAMPLING

Surface water/sediment sampling was conducted March 6 through 7 to determine whether contaminants have migrated via the ground water/surface water interface. A total of 6 surface water samples were collected, including 2 duplicates (Figure 6-2, Table 6-5). All samples were collected according to the EPA Region VII SOP for surface water sample collection, 2334.7A. Samples were submitted to EPA for Total Petroleum Hydrocarbons, volatiles, semi-volatiles, cyanide, total metals, and dissolved metals analyses. Total and dissolved metals samples were preserved with nitric acid, cyanide samples were preserved with sodium hydroxide, and all samples were stored on ice. The field parameters temperature, pH, and conductivity, were measured and recorded in the field (Table 6-6).

A total of 4 sediment samples were collected, including a duplicate (Figure 6-2, Table 6-4). All samples were collected according to the EPA Region VII SOP for sediment sample collection, 2334.8A. Samples were submitted to EPA for Total Petroleum Hydrocarbons, volatiles, semi-volatiles, cyanide, and total metals analyses. Surface water and sediment samples were screened on site in the mobile lab for the presence of PAHs and VOCs (Tables 6-2 and 6-3).

6.5 PRODUCT SAMPLING

One oil sample was to be collected from the basement of the former Mound Street Power Plant, if the building was standing and oil was present in the basement. At the time of the SSI, the building was in the process of being razed. Due to the danger involved with entering

Table 6-6
Field Parameters for Water Samples
LaClede Coal Gas
St. Louis, Missouri
Sample Series DSX44
March 1991

Sample #	Temperature (C°)	pH	Conductivity (umhos)
301	7	8.15	440
301D	7	8.15	440
302	6	7.87	450
303	6	7.27	360
304	3	7.05	350
304D	3	7.05	350
201	11	7.58	1,500
202	7	7.81	2,000
203	9	6.32	1,500
204	9	6.21	1,400
206	11	6.14	1,600
206D	11	6.14	1,600
207F	--	---	--
208	4	7.00	16
209F	--	----	--

Note: See Figure 6-2 for sample locations.

this building, the sample was not collected. However, an oil sample (sample 501) was collected from an 80,000-gallon tank on site (Figure 6-2). This tank contained #6 oil, the same type of oil that was spilled in 1986 and entered the basement of the former power plant. This oil sample was submitted to EPA for total petroleum hydrocarbons, VOCs, and semi-volatiles analyses. It was also screened on site in the mobile lab. The chromatogram peaks were close to the retention times for the contaminants being screened, but did not match (Table 6-3).

SECTION 7: ANALYTICAL RESULTS

7.1 SURFACE SOIL SAMPLES (0-2 FEET)

The surface soil (0-2 feet) sampling data indicated that the majority of the 7-acre site is significantly contaminated with cyanide at greater than three times the detection limit of the background sample 112 (Figure 6-2; Table 7-1). Analysis of off site samples 110, 111, and 112 revealed no cyanide contamination over their detection limits of 6.2, 6.2, and 6.7, respectively (Figure 6-2).

Surface soil PAH contamination was less extensive than the surface soil cyanide contamination. Four out of the 12 samples collected contained a total PAH content greater than five times the concentration of the background sample. These were samples 104, 105, 107 and 109 (Figure 6-2; Table 7-1).

The cyanide contamination found on site can be attributed to the FMGP based on the fact that cyanide is an oxide waste produced during the gas purification process (see Section 4 for details). There should not be any attribution from current on site activities, because cyanide is not a constituent normally found in oil or asphalt.

Attribution of PAH contamination in the surface soil samples is difficult to assess. The oil sample data indicated significant concentrations of many PAH compounds (Appendix D, Sample 501). PF & T currently stores #6 oil and asphalt on site in very large quantities. In 1986, PF & T experienced a spill of said oil which covered most of the site. Thus, surface soil PAH contamination could be attributed to PF & T activities or to the FMGP, based on the fact that it was common practice for FMGPs to bury tar and purifier waste on site. PAHs are a major constituent of coal tar waste.

7.2 SUBSURFACE SOIL SAMPLES

FASP screening results indicated that the highest PAH contamination zone was located in the central portion of the tank farm currently on site (Figure 6-1; Tables 6-2 and 6-3). The approved work plan allowed E & E/FIT to collect CLP subsurface soil samples at four locations. A total of eight samples (006-013) were collected at depths ranging from 3

Table 7-1
PAHs and Cyanide In Surface Soils
Laclede Coal Gas Site
St. Louis, Missouri
E & E/FIT; March 1991
Sample Series DSX44
(mg/kg)

Compound	101	102	103	104	105	106	107	108	109	110	111	112*
Napthalene	--	--	--	--	--	--	60	1.1	0.51	--	--	0.41U
2-Methylnaphthalene	--	--	--	--	--	--	13	2.5	--	--	--	0.41U
2-Chloronaphthalene	--	--	--	--	--	--	--	--	--	--	--	0.41U
Acenaphthylene	--	--	--	--	--	--	--	2.4	0.46	--	--	0.41U
Acenaphthene	--	--	--	--	--	--	--	0.69	--	--	--	0.41U
Fluorene	--	--	--	--	12	--	--	3.1	--	--	--	0.41U
Phenanthrene	--	--	--	20	55	1.5	--	--	2.2	1.5	0.85	0.44
Anthracene	--	--	--	--	--	--	--	--	0.78	--	--	0.41U
Fluoranthene	--	--	--	14	38	2.0	--	--	2.8	2.2	0.77	1.3
Pyrene	--	21	13	50	83	2.2	--	--	6.7	2.3	0.81	1.4
Benzo(a)anthracene	--	--	--	21	28	1.3	--	--	4.5	1.5	0.48	0.79
Chrysene	--	--	--	29	29	1.2	--	--	4.3	1.6	0.55	0.85
Benzo(b)fluoranthene	--	--	--	--	17	1.0	--	--	4.9	1.1	0.44	0.61
Benzo(k)fluroanthene	--	--	--	--	12	0.89	--	--	3.4	1.2	0.45	0.68
Benzo(a)pyrene	--	--	--	16	22	1.1	--	--	4.2	1.3	0.44	0.70
Indeno(1,2,3-CD) Pyrene	--	--	--	--	--	0.66	--	--	2.7	0.76	--	0.41U
Dibenzo(a,h)anthracene	--	--	--	--	--	--	--	--	--	--	--	0.41U
Dibenzo(g,h,i)perylene	--	--	--	--	12	0.71	--	--	2.6	0.76	--	0.41U
Total PAH Content	--	21	13	150	308	12.5	73	9.8	40.0	14.2	4.8	6.8
Cyanide	33	--	94	220	190	--	14	98	35	--	--	6.7U

* = Background sample
-- = Undetected (U); Detection limit stated for bckground sample.

Note: See Figure 6-2 for sample locations and Appendix D for complete analytical results.

to 17 feet. An additional five samples (001-005) were collected at a background location (Figure 6-2; Table 6-4). CLP data revealed significant PAH contamination at least five times greater than background concentration at all four sampling locations (Table 7-2). Cyanide contamination was found to be significant to a depth of 11+ feet (Table 7-2).

All the soil samples were also analyzed for total and dissolved metals, as well as volatiles. However, results proved to be negligible when compared to background concentrations with the exception of significant concentrations of benzene, toluene, ethyl benzene, and total xylenes (BTEX) in samples 006 through 011 (except no toluene in sample 011). Significant benzene was also detected in sample 013. Styrene (14J µg/kg) was detected in sample 012.

As was the case with the surface soil samples, the cyanide contamination can be attributed to the FMGP. It is probable that the deep soil PAH contamination came from both the FMGP and the petroleum tank farm. The presence of mixed BTEX compounds and PAHs indicates a mixed source, as volatiles are not considered abundant in coal tar.

7.3 GROUND WATER SAMPLES

Ground water sampling data indicated no significant dissolved metals contamination when compared to background concentrations. Some organics were detected; however, in sample 204, piezometer well located downgradient of the site. This sample contained 3 PAHs: acenapthalene (65 µg/L), fluorene (25 µg/L), and phenanthene (46 µg/L); and 93 µg/L benzene (Figure 6-2; Appendix C). Additionally, cyanide was detected in all ground water samples at concentrations above the 17 µg/L detection limit: 520J µg/L in sample 201, 27J µg/L in sample 202, 590J µg/L in sample 203, and 1,600J µg/L in sample 204. Cyanide was not detected in the background sample.

7.4 SURFACE WATER AND SEDIMENT SAMPLES

Surface water and sediment was sampled at three locations downgradient of the site. Additionally, the East St. Louis raw water intake, located across the Mississippi River from the site was sampled

Table 7-2
PAHs and Cyanide in Subsurface Soil Samples
and Product Sample
Laclede Coal Gas Site
St. Louis, Missouri
E & E/FIT; March 1991
Sample Series DSX44
(mg/kg)

Compound	(2-7') 001*	(7-11') 002*	(11-15') 003*	(17-21') 004*	(19-23') 005*	(3-8') 006	(8-13') 007	(8-12') 008	(4-8') 009	(12-14') 010	(11-17') 011	(5-11') 012	(11-12.5') 013	501
Naphthalene	--	0.40U	--	--	--	23	87	2200	68	0.89	30	--	55	700
2-methylnaphthalene	--	0.40U	--	--	--	80	43	69	84	0.98	23	--	--	4000
2-chloronapththalene	--	0.40U	--	--	--	--	--	--	--	--	--	--	--	450
Acenaphthylene	--	0.40U	--	--	--	--	--	15	--	--	20	--	--	450
Acenaphtene	--	0.40U	--	--	--	--	--	32	12	0.15	15	--	22	620
Fluorene	--	0.40U	--	--	--	20	--	J	13	0.17	24	--	21	830
Phenanthrene	1.4	0.40U	--	--	--	63	20	J	46	0.51	71	--	59	300
Anthracene	0.38	0.40U	--	--	--	--	--	J	--	--	23	--	18	110
Fluoranthene	2.0	0.52	0.54	--	--	--	--	--	--	--	180	--	39	620
Pyrene	2.8	0.53	0.80	--	--	48	J	J	J	J	J	--	65	2800
Benzo(a)anthracene	1.8	0.40U	--	--	--	18	--	J	--	--	99	--	21	1600
Chrysene	1.8	0.40U	0.44	--	--	18	--	J	16	0.18	94	--	21	2700
Benzo(b) fluoranthene	1.6	0.40U	--	--	--	--	--	61	--	--	76	--	15	--
Benzo(k)fluoranthene	1.4	0.40U	--	--	--	--	--	52	--	--	89	--	17	--
Benzo(a)pyrene	1.5	0.40U	--	--	--	--	--	95	--	--	120	--	23	970
Indeno(1,2,3-CD) pyrene	0.93	0.40U	--	--	--	--	--	37	--	--	75	--	--	--
Dibenzo(a,h)anthracene	--	0.40U	--	--	--	--	--	--	--	--	--	--	--	--
Dibenzo(g,h,i)perylene	1.2	0.40U	--	--	--	--	--	44	--	--	88	--	--	--
Total PAH Content	16.8	1.1	1.8	--	--	270	150	2605	239	2.9	1027	--	376	20,850
Cyanide	26	24	--	--	--	87	180	860	--	48	250	170	--	--

* = Background sample
-- = Undetected (U) with detection limit given for background sample 002.
J = Detected, but results are invalid.

Note: See Figure 6-2 for sample locations and Appendix D for complete analytical results.

(304 and 304D). The most upgradient of these samples (302 and 402) generally exhibited the most contamination, though concentrations are fairly comparable (Tables 7-3 and 7-4). An exception is total chromium (12-14 µg/L), lead (15-18 µg/L), and zinc (46-54 µg/L) detected in samples 304 and 304D, collected from the surface water intake. These metals were not detected in the dissolved fraction of these samples. The only organics deteced in these samples are relatively low levels of PAHs and cyanide found in the sediment samples (Table 7-4). A background sediment and surface water sample was not collected, so that no comparisonn to background can be made for these metals. However, sample concentrations are relatively low as compared to other samples collected.

7.5 PRODUCT SAMPLE

The oil sample (501) collected from an 80,000-gallon tank (Figure 2-3, tank #7) contained significant concentrations of many PAHs (Table 7-2). Attribution of PAH contamination on site is very difficult to assess, based on the fact that in 1986, PF & T experienced a spill of the same oil (#6) which was sampled, over the entire site. It was also common practice for FMGPs to bury their tar wastes on site. PAHs are a major constitudent of coal tar wastes. Thus, surface and subsurface soil PAH contamination could be attributable to either PF & T activities or the FMGP.

Table 7-3
Selected Total Metals
Sediment and Surface Water Samples
Laclede Coal Gas Site
St. Louis, Missouri
E & E/FIT; March 1991
Sample Series DSX44

Sample #	As	Ba	Cu	Cr	Ni	Pb	Se	V	Zn
				Sediment Samples (mg/kg)					
401	3.7	140	9.1	8.7	10	30J	--.--	15	35J
401D	4.0	140	8.2	9.0	11	13J	--.--	17	36J
402	8.4	160	26	16	18	36J	2.0J	27	77J
403	7.1	160	23	12	16	31J	--.--	25	64J
				Water Samples (µg/L)					
301	--.--	--.--	--.--	--.--	--.--	7.0	--.--	--.--	--.--
301D	--.--	--.--	--.--	--.--	--.--	7.2	--.--	--.--	--.--
302	--.--	--.--	--.--	--.--	--.--	9.7	--.--	--.--	--.--
303	--.--	280	--.--	--.--	--.--	24U	I*	62	89U
304	--.--	--.--	--.--	14	--.--	18	--.--	--.--	54
304D	--.--	--.--	--.--	12	--.--	15	--.--	--.--	--.--

* = Invalid analysis, but 11 µg/L dissolved selenium was detected in this sample.
U = Undetected; detection limit given if above detected values.
J = Results are reported, but invalid by approved QC procedures.

Note: See Figure 6-2 for sample locations and Appendix D for complete analytical results.

Table 7-4
PAHs, Cyanide, and Total Hydrocarbons
Sediment Samples
Laclede Coal Gas Site
St. Louis, Missouri
E & E/FIT; March 1991
Sample Series DSX44

(µg/kg)	401	401D	402	403
Phenanthene	---	---	2900	4400
Fluoranthene	---	750	5000	5100
Pyrene	---	960	8000	6400J
Benzo(a)anthracene	---	460	3500	4200
Di-n-octyl phthalate	--	470	3900	4900
Benzo(k)fluoranthene	---	---	2900	3100
Benzo(a)pyrene	---	430	2600	5600
Benzo(GHI)perylene	---	---	3500	4100
Cyanide	---	---	1600	---
Total hydrocarbons	3100	3100U	8200	4900

J = Results are reported, but invalid by approved QC procedures.
U = Undetected, with detection limit given.
--- Indicated undetected with detection limits below detected values.

Note: See Figure 6-2 for sample locations and Appendix D for complete analytical results.

SECTION 8: SUMMARY AND CONCLUSIONS

A screening site inspection was conducted at the Laclede Coal Gas site, St. Louis, Missouri. The Laclede site is a FMGP presently occupied partially by a petroleum tank farm. The site was originally investigated as the Mound Street Power Plant, due to observed oily waste releases to the adjacent Mississippi River. Previous oil sampling has not detected polychlorinated biphenyls (PCBs). The Laclede FMGP is thought to be the largest FMGP in EPA Region 7. The presence of a surface water intake located almost directly across the Mississippi River from the site, prompted EPA to request an SSI of the site. The purpose of the investigation was to evaluate the potential threat this site poses to the ground water, surface water, air and on-site pathways. These objectives were addressed through both non-sampling and sampling data collection strategies. Non-sampling data allowed the development of a detailed background on all potential targets. The sampling allowed identification of on-site contaminants, and gathered data on the areal and vertical extent of contamination.

Non-sampling data indicated that the only potential primary targets for the site included a population of approximately 300,000 people who receive drinking water from the intake located directly across the Mississippi River from the site. Sampling data, however, indicated that these people are secondary targets because no significant contamination was found in the surface water samples (including an intake sample).

Thirteen subsurface soil, twelve surface soil, six surface water, four sediment, six ground water, and one oil sample were collected and submitted to the CLP for volatiles, semi-volatiles, metals, and cyanides analysis. Additionally, the FASP screened 92 samples on-site to help select CLP sample locations. Seventeen drums of IDW were generated and a subcontractor used for soil sampling.

The sampling data identified cyanides, BTEX compounds, and PAHs as the major on-site contaminants. The cyanide contamination was found throughout the site in the 0 to 2 feet deep soil samples. Deeper soil samples revealed cyanide contamination at depths as great as at least 11 feet. PAH contamination, both in shallow and deep soil samplings, was restricted to small areas within the site as evidenced by FASP data and

was found at depths as great as 38 feet. The greatest area of PAH contamination was found within the bermed tank farm (Figure 6-2). Only one ground water sample (204) showed PAH contamination, but all contained cyanide. Benzene was also detected in sample 204.

Attribution is difficult to assess because PF & T currently stores #6 oil on site in large quantities. The total PAH content of this oil is very high. PF & T experienced a spill of this oil over the entire site in 1986. BTEX compounds were found at relatively high concentrations in several subsurface soil samples, indicating BTEX wastes are sometimes mixed with PAH wastes. It is known tht FMGPs frequently buried coal tar waste on site. PAHs are a major constituent of coal tars. Thus, both the FMGP and PF & T could be responsible for the PAH contamination found abundantly in on-site soils, and to a much lesser extent in the ground water. The cyanide contamination, however, is assumed to largely be a result of the FMGP as cyanide is not considered a significant constituent of most oils.

SECTION 9: BIBLIOGRAPHY

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APPENDIX A

Technical Directive Document

KB

1A. Cost Center: FIT 07

1B. Account Number: M005

FIT ZONE II CONTRACT
Contract Number 68-01-7347
TECHNICAL DIRECTIVE DOCUMENT (TDD)

2. TDD Number: F 097-9008-020

2A. Amendment: ☒ Administrative ☐ Technical

3A. Priority: ☐ High ☒ Medium ☐ Low

3B. Key EPA Contact: Name: GREG REESOR Phone: 551-7695

4A. Estimate of Technical Hours:	4B. Subcontract:	4C. Estimate of Subcontract Cost:	5A. SSID Number:	5B. CERID Number:
*1315	T&M IDW DISPOSAL T&M DRILLING	*NTE 35,882 22,000	UNASSIGNED	MOD981715980

5C. EPA Site Name: LACLEDE COAL GAS SITE

5D. City/County/State: ST. LOUIS/ST. LOUIS/MISSOURI

6. Desired Report Format: ☒ Formal Report ☐ Standard Report ☐ Other (Specify): ☐ Letter Report ☐ Formal Briefing

7A. Activity Start Date: 8/29/90

7B. Estimated Completion Date: 10/31/91

8A. Type of Activity: ☐ PA ☐ RCRA-PA ☐ HRS Support ☐ Enforcement Support ☐ Training ☒ SI ☐ RCRA-SI ☐ QA Support ☐ Program Management ☐ General Technical Assistance ☐ ESI ☐ Special Studies ☐ Equipment Maintenance

8B. FIT/SCAP Goal: Will Deliverable Meet a Unit of the Goal? ☒ Yes ☐ No

9. General Task Description: PERFORM A SCREENING SITE INVESTIGATION OF THE LACLEDE COAL GAS SITE LOCATED IN ST. LOUIS, MISSOURI.

RECEIVED
SEP 18 1991

10. Specific Elements:

1. REVIEW BACKGROUND INFORMATION
2. PREPARE DRAFT HRS SCORE
3. CONDUCT SITE RECONNAISSANCE
4. PREPARE WORK PLAN
5. PREPARE BID SPECS AND SUBCONTRACT PACKAGES
6. IMPLEMENT WORK PLAN AND PRODUCE TRIP AND FINAL REPORTS (DRAFT)*
7. *OVERSEE SUBCONTRACTOR SAMPLE AND DISPOSAL OF IDW DRUMS

☐ Additional Scope Attached

E&E K.C.K.

11. Interim Deadlines:

6. EST. 10/15/91 *

12. Comments: *AMENDED TO ADD TWO SUBCONTRACTOR (IDW) OVERSIGHT TRIPS TO SITE (60 HOURS). ONLY DRAFT FINAL REPORT IS EXPECTED BY CONTRACT COMPLETION.

13. Authorizing: Pete Eulen (Signature) ☒ RPO ☐ DPO ☐ PO

14. Date: 9/16/91

15. Received by: Grant P. Martin (Contractor FITOM Signature) ☒ Accepted ☐ Accepted with Exceptions (Attached) ☐ Rejected

16. Date: 9/18/91

Distribution: Sheet 1 (White)—FITOM Copy; Sheet 2 (Green)—RPO Copy; Sheet 3 (Canary)—ZPM, WDC Copy; Sheet 4 (Pink)—PO, WDC Copy; Sheet 5 (Goldenrod)—CO, WDC Copy

F001A097

APPENDIX B

EPA Site Inspection Form 2070-13

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MO	D981715980

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Laclede Coal Gas	Foot of Mullanphy Street

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
St. Louis	MO	63105			

09 COORDINATES		10 TYPE OF OWNERSHIP (Check one)
LATITUDE	LONGITUDE	
38° 38' 20.0"	090° 11' 00.0"	x A. PRIVATE ___B. FEDERAL _____ ___C. STATE ___D. COUNTY ___E. MUNICIPAL ___F. OTHER _____ ___G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION		
3/3/91	x ACTIVE	1888	1945	___UNKNOWN
MO/DAY/YR	___INACTIVE	BEGINNING YEAR	ENDING YEAR	

04 AGENCY PERFORMING INSPECTION (Check all that apply)

___A. EPA x B. EPA CONTRACTOR E & E/FIT (Name of firm) ___C. MUNICIPAL ___D. MUNICIPAL CONTRACTOR _____ (Name of firm)

___E. STATE ___F. STATE CONTRACTOR _____ (Name of firm) ___G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Keith A. Brown	Environmental Scientist	E & E/FIT	(913) 432-9961
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
Anne Melia	Chemist	E & E/FIT	(913) 432-9961
Chris Williams	Geologist	E & E/FIT	(913) 432-9961
Well McCall	Geologist	E & E/FIT	(913) 432-9961
John Peck John Strobel	Geologist Chemist	E & E/FIT	(913) 432-9961
Patty Roberts	Environmental Scientist	E & E/FIT	(913) 432-9961
13 SITE REPRESENTATIVES INTERVIEWED	**14 TITLE**	**15 ADDRESS**	**16 TELEPHONE NO.**
Randel Lewis	Terminal Manager	Foot of Mullanphy Street	(314) 621-0522
			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
x PERMISSION ___ WARRANT	NA	

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Greg Reesor	EPA/Superfund	(913) 551-7695

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Keith A. Brown	E & E	FIT	(913) 432-9961	10/30/91

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE MO	02 SITE NUMBER D981715980

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- x A. SOLID
- B. POWDER, FINES
- x C. SLUDGE
- D. OTHER _____ (Specify)
- E. SLURRY
- x F. LIQUID
- G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS Unknown
CUBIC YARDS _____
NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- x A. TOXIC
- B. CORROSIVE
- C. RADIOACTIVE
- x D. PERSISTENT
- E. SOLUBLE
- F. INFECTIOUS
- G. FLAMMABLE
- H. IGNITABLE
- I. HIGHLY VOLATILE
- J. EXPLOSIVE
- K. REACTIVE
- L. INCOMPATIBLE
- M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	Unknown		Coal tars
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS	Unknown		Purifier wastes
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
IOC	Cyanides	143-33-9	Burial	>500	ppm
		151-50-8			
SLU	Poly Aromatic	8007452	Burial	>100	ppm
	hydrocarbons (PAHs)				

V. FEEDSTOCKS (See Appendix for CAS Numbers) NA

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E & E/FIT files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MO	D981715980

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 x A. GROUND WATER CONTAMINATION — 02 X OBSERVED (DATE: 3/1991) x POTENTIAL ___ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: None known — 04 NARRATIVE DESCRIPTION

Three PAHs and benzene were detected in a downgradient well. No ground water in the surrounding area is known to be used for drinking.

01 x B. SURFACE WATER CONTAMINATION — 02 ___ OBSERVED (DATE:) x POTENTIAL ___ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: 300,000 — 04 NARRATIVE DESCRIPTION

There is a strong potential for a ground water to surface water release of contamination, however, no contamination was detected immediately downgradient of the site. Low potential for release to surface water intake located across the Mississippi River.

01 x C. CONTAMINATION OF AIR — 02 ___ OBSERVED (DATE:) x POTENTIAL ___ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: ___ — 04 NARRATIVE DESCRIPTION

Low potential for air contamination due to site's gravel covering.

01 ___ D. FIRE/EXPLOSIVE CONDITIONS — 02 ___ OBSERVED (DATE:) ___ POTENTIAL ___ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: ___ — 04 NARRATIVE DESCRIPTION

None known in relation to FMGP.

01 x E. DIRECT CONTACT — 02 x OBSERVED (DATE: 3/1991) x POTENTIAL ___ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: on-site workers — 04 NARRATIVE DESCRIPTION

Surface soils within the site boundaries are contaminated with cyanide and PAHs.

01 x F. CONTAMINATION OF SOIL — 02 x OBSERVED (DATE: 3/1991) ___ POTENTIAL ___ ALLEGED

03 AREA POTENTIALLY AFFECTED: unknown to date (Acres) — 04 NARRATIVE DESCRIPTION

Cyanide in the 10 to 100s ppm range. Total PAHs in the 10 to 1000s ppm range.

01 ___ G. DRINKING WATER CONTAMINATION — 02 ___ OBSERVED (DATE:) ___ POTENTIAL ___ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: ___ — 04 NARRATIVE DESCRIPTION

None known.

01 x H. WORKER EXPOSURE/INJURY — 02 ___ OBSERVED (DATE:) ___ POTENTIAL ___ ALLEGED

03 WORKERS POTENTIALLY AFFECTED: ___ — 04 NARRATIVE DESCRIPTION

See Direct Contact above.

01 ___ I. POPULATION EXPOSURE/INJURY — 02 ___ OBSERVED (DATE:) ___ POTENTIAL ___ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: ___ — 04 NARRATIVE DESCRIPTION

None known.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MO	D981715980

II. HAZARDOUS CONDITIONS AND INCIDENTS (CONTINUED)

01 ___ J. DAMAGE TO FLORA — 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED

04 NARRATIVE DESCRIPTION

None observed.

01 ___ K. DAMAGE TO FAUNA — 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED

04 NARRATIVE DESCRIPTION (Include name(s) of species)

None observed.

01 _x_ L. CONTAMINATION OF FOOD CHAIN — 02 ___ OBSERVED (DATE: _____) _x_ POTENTIAL ___ ALLEGED

04 NARRATIVE DESCRIPTION

This may occur if surface water is contaminated, however, present sampling did not detect significant surface water contamination.

01 _x_ M. UNSTABLE CONTAINMENT OF WASTES — 02 ___ OBSERVED (DATE: _____) _x_ POTENTIAL ___ ALLEGED

(Spills/runoff/standing liquids/leaking drums)

03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

Waste may be land applied or buied in unlined pits.

01 ___ N. DAMAGE TO OFF-SITE PROPERTY — 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED

04 NARRATIVE DESCRIPTION

None known.

01 ___ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED

04 NARRATIVE DESCRIPTION

None known.

01 ___ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED

04 NARRATIVE DESCRIPTION

None known.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

E & E/FIT observed oil and coal tars leaching directly in Mississippi River via an abandoned pump house pipes. The pipes have been sealed with concrete, but contaminants are leaching through the concrete plugs.

III. TOTAL POPULATION POTENTIALLY AFFECTED: 300,000

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E & E/FIT on site reconnaissance, November 20, 1990
E & E/FIT files
E & E/FIT SSI, March 3-9, 1991

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MO	D981715980

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
___A. NPDES				
___B. UIC				
___C. AIR				
___D. RCRA				
___E. RCRA INTERIM STATUS				
___F. SPCC PLAN				
___G. STATE (Specify)				
___H. LOCAL (Specify)				
___I. OTHER (Specify)				
x J. NONE KNOWN				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
___A. SURFACE IMPOUNDMENT		
___B. PILES		
___C. DRUMS, ABOVE GROUND		
x D. TANK, ABOVE GROUND	Present land use	
___E. TANK, BELOW GROUND		
___F. LANDFILL		
___G. LANDFARM		
___H. OPEN DUMP		
x I. OTHER Buried pits (Specify)	Unknown	FMGP

04 TREATMENT (Check all that apply)

___A. INCINERATION
___B. UNDERGROUND INJECTION
___C. CHEMICAL/PHYSICAL
___D. BIOLOGICAL
___E. WASTE OIL PROCESSING
___F. SOLVENT RECOVERY
___G. OTHER RECYCLING/RECOVERY
___H. OTHER _____ (Specify)

05 Other

x A. BUILDINGS ON SITE

06 AREA OF SITE

~7 (Acres)

07 COMMENTS

A petroleum tank farm currently occupies the site. Subsurface exploration reveals that most of the old coal gas plant rubble and other construction debris underlies the site.

IV. CONTAINMENT

1 CONTAINMENT OF WASTES (Check one)

___A. ADEQUATE, SECURE ___B. MODERATE ___C. INADEQUATE, POOR x D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

Coal tar and purifier waste was generally disposed of on site or sold.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ___YES x NO

02 COMMENTS

Most of the site is covered with gravel.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E & E/FIT files
E & E/FIT SSI, March 3-9, 1991

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPOR
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MO	D981715980

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. x	B. ___
NON-COMMUNITY	C. x	D. ___

02 STATUS

	NA		
	ENDANGERED	AFFECTED	MONITORED
	A. ___	B. ___	C. ___
	D. ___	E. ___	F. ___

03 DISTANCE TO SITE

Greater than nine miles up-gradient & directly across Mississippi River.

A. _____ (mi)

B. _____ (mi)

III. GROUND WATER

01 GROUND WATER USE IN VICINITY (Check one)

___A. ONLY SOURCE FOR DRINKING ___B. DRINKING (Other sources available) ___C. COMMERCIAL, INDUSTRIAL IRRIGATION (Limited other sources available) x D. NOT USED, UNUSEABLE

COMMERCIAL, INDUSTRIAL, IRRIGATION (N. other water sources available)

02 POPULATION SERVED BY GROUND WATER: None known

03 DISTANCE TO NEAREST DRINKING WATER WELL: Unknown (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
25-30 (ft)	Southeast	25 (ft)	Unknown (gpd)	___YES x NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

No wells are known within four miles of the site. Ground water is not used in the vicinity due to the abundance of surface water.

10 RECHARGE AREA		11 DISCHARGE AREA	
___YES	COMMENTS	x YES	COMMENTS
x NO		___NO	

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

x A. RESERVOIR, RECREATION DRINKING WATER SOURCE ___B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES x C. COMMERCIAL, INDUSTRIAL ___D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Mississippi River	___	< 1/4 (mi)
_____	___	_____ (mi)
_____	___	_____ (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 6586	B. 32,564	C. 100,924
NO. OF PERSONS	NO. OF PERSONS	NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION: < 1/4 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE: Heavy industrial area

04 DISTANCE TO NEAREST OFF-SITE BUILDING: < 1/2 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

Densely populated urban area.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MO	D981715980

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one) Unknown

___A. 10^{-6} - 10^{-8} cm/sec ___B. 10^{-4} - 10^{-6} cm/sec ___C. 10^{-4} - 10^{-3} cm/sec ___D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one) Unknown

___A. IMPERMEABLE (Less than 10^{-6} cm/sec) ___B. RELATIVELY IMPERMEABLE (10^{-4} - 10^{-6} cm/sec) ___C. RELATIVELY PERMEABLE (10^{-2} - 10^{-4} cm/sec) ___D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
2-30 (ft)	20 (ft)	Unknown

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
0 (in)	3 (in)	0-5 %	Easterly	1-2 %

09 FLOOD POTENTIAL
SITE IS IN 500 YEAR FLOODPLAIN

10 ___ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. greater than 4 (mi)
OTHER: B. greter than 4 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)
< 1 (mi)
ENDANGERED SPECIES: Sicklefin Chub

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AG LAND
A. <1 (mi)	B. < 1 (mi)	C. Unknown (mi)	D. ___ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Site is located on the flood plain of the Mississippi River.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E & E/FIT files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE MO	02 SITE NUMBER D981715980

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUND WATER	6	CLP	Current
SURFACE WATER	6	CLP	Current
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL/Sediment	25/4	CLP	Current
VEGETATION			
OTHER (Product)	1	CLP	Current

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
FASP	92 soil, 3 sediment, and 4 surface water samples were collected and screened on site in a mobile lab. These samples were not submitted for CLP analysis.
Parameters	pH, conductivity, and temperature were recorded for ground and surface water samples.

IV. PHOTOGRAPHS AND MAPS

01 TYPE x GROUND ___ AERIAL

02 IN CUSTODY OF E & E/FIT
(Name of organization or individual)

03 MAPS
x YES
___ NO

04 LOCATION OF MAPS
E & E/FIT

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E & E/FIT files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MO	D981715980

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. BOX, RFD #, ETC.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
Petroleum, Fuel & Terminal Co.		Foot of Mullanphy		St. Louis	MO	63105

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER	10 STREET ADDRESS (P.O. BOX, RFD #, ETC.)	11 SIC CODE	12 CITY	13 STATE	14 ZIP CODE
Apex Oil						

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
Laclede Gas & Light Co.		Unknown				
Mound Street Warehouse Corp.		Unknown				

IV. REALTY OWNER(S) (If applicable; list most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E & E/FIT files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MO	D981715980

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. BOX, RFD #, ETC.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE	08 YEARS OF OPERATION	09 NAME OF OWNER
NA								

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER	12 STREET ADDRESS (P.O. BOX, RFD #, ETC.)	13 SIC CODE	14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE	08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD
							1888-1945	

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E & E/FIT files

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MO	D981715980

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER	
NA		
03 STREET ADDRESS (P.O. BOX, RFD #, ETC.)	04 SIC CODE	
05 CITY	06 STATE / 07 ZIP CODE	

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
NA			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
NA			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E & E/FIT files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MO	D9[illegible]715580

II. PAST RESPONSE ACTIVITIES

01 ___A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None known.

01 ___B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None known.

01 ___C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None known.

01 ___D. SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None known.

01 ___E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None known.

01 ___F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None known.

01 ___G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None known.

01 _x_H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
It was common practice for FMGPs to bury tar and purifier wastes on site.

01 ___I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None known.

01 ___J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None known.

01 ___K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None known.

01 ___L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None known.

01 ___M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None known.

01 ___N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None known.

01 ___O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None known.

01 ___P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None known.

01 ___Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None known.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MO	D981715980

II. PAST RESPONSE ACTIVITIES (Continued)

01 ___R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____

04 DESCRIPTION
None known.

01 ___S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____

04 DESCRIPTION
None known.

01 ___T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____

04 DESCRIPTION
None known.

01 ___U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____

04 DESCRIPTION
None known.

01 ___V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____

04 DESCRIPTION
None known.

01 ___W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____

04 DESCRIPTION
None known.

01 ___X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____

04 DESCRIPTION
None known.

01 ___Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____

04 DESCRIPTION
None known.

01 ___Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____

04 DESCRIPTION
None known.

01 _x_1. ACCESS TO SITE RESTRICTED (partially) — 02 DATE _____ — 03 AGENCY _____

04 DESCRIPTION
A locked eight-foot chain-linked fence with barb wire running across the top surrounds the tank farm area.

01 ___2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____

04 DESCRIPTION
None known.

01 ___3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____

04 DESCRIPTION
None known.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E & E/FIT files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE MO	02 SITE NUMBER D981715980

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ___YES x NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

None known.

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E & E/FIT files

EPA FORM 2070-13 (7-81)

APPENDIX C

Site Contacts and Property Owners

Site Contacts

Randel H. Lewis
Terminal Manager
Petroleum, Fuel & Terminal Company
St. Louis, MO 63105
(314) 621-0522

Dick Block
Assistant Terminal Manager
Terminal Manager
Petroleum, Fuel & Terminal Company
St. Louis, MO 63105
(314) 621-0522

Bob Welch
Terminal Property Manager
Terminal Manager
Petroleum, Fuel & Terminal Company
St. Louis, MO 63105
(314) 621-0522

Greg Reesor
Missouri Coordinator
U.S. Environmental Protection Agency
Region VII
726 Minnesota Avenue
Kansas City, KS
(913) 551-7695

Property Owner Information

Property Owner	Sample #'s
Richard Weidner TRRA 2016 Madison Ave. Granite City, IL 62040	110, 111 201, 202
Marty Anamosa Glacier Park Co. 1011 Western Ave., Ste. 700 Seattle, WA 98104	112
David Bohm City Hall City Counselor's Office, Rm. 314 St. Louis, MO 63103	301 - 303 401 - 403
Doug Mitchem Illinois American Water Co. 300 N. Water Works Dr. Belleville, IL 62223	304, 304D
Randall Lewis PF & T Foot of Mullanphy St. St. Louis, MO 63105	001 - 013 101 - 109 501

APPENDIX D

EPA Data Transmittal

ICF Technology Incorporated
NSI Technology Services Corporation
The Bionetics Corp.

EPA Region VII Laboratory
25 Funston Rd.
Kansas City, KS 66115
(913) 236-3881

To: Larry Marchin & Barry Evans
Data Review Task Monitors

Thru: Harold Brown, Ph.D.
ESAT Deputy Project Officer, EPA

From: Laleh A. Jonooby
Senior Scientist, ESAT

Thru: Ronald A. Ross
Region VII ESAT Team Leader, NSI-TS

Date: April 19, 1991

Subject: Review of organic data for Laclede Coal Gas
TID #: 07-9103-535
ICF Acct. #: 302-26-535-02
NSI Sales Order : 1073-535
Activity Number : DSX44
ESAT Document Control #:.. ESAT-VII-535-0011
Assignment Number : 764

These data were reviewed according to the "Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses," and the Region VII Organic Data Review Training Manual as guidance. The following comments and attached data sheets are a result of the ESAT review of the above mentioned data from the contract laboratory.

SAS NO.: 6082-G
SITE: Laclede Coal Gas
REVIEWER: A. Jonooby
MATRIX: Water, Soil and Oil

LABORATORY: RECRA ENV.,INC.
METHOD NO.: 418.1
EPA ACTIVITY NO.: DSX44

SMO Sample No.	EPA Sample No.	SMO Sample No.	EPA Sample No.
6082-001	DSX44301	6082-009	DSX44401D
6082-002	DSX44301D	6082-010	DSX44402
6082-003	DSX44302	6082-011	DSX44403
6082-004	DSX44304	6082-012	DSX44501
6082-005	DSX44304D		
6082-006	DSX44207F		
6082-007	DSX44303		
6082-008	DSX44401		

And QC samples DSX44304 (MS), 303 (DUP), 401 (DUP), 401D (MS), 501 (MS), 501 (DUP), 910M, 911M and 912M.

General

This data review assignment covers SEVEN WATER samples (DSX44301 - 304 and 207F), FOUR SOIL samples (DSX44401 - 403) and ONE OIL sample (DSX44501) analyzed for total petroleum hydrocarbons (TPHs). Field blank and field duplicate were included in this assignment. TPHs traffic reports were present.

1. Holding Times and Preservation

There are no established holding times for TPHs. Sample preservation is to keep cold at 4 degrees C.

2. Method Blanks / Field Blanks

All of the method blanks and field blank were reported below method detection limits. For the water samples, the field blank and the method blank were reported as <0.5 mg/L, for soil samples, the method blank was reported to be <25 mg/L and the method blank analyzed with the oil sample was reported to be <1000 mg/L.

3. Initial Calibrations

A six point calibration curve using reference oil #1 as the source at an absorbance of 2930 cm-1 was established for this activity. A correlation coefficient of 0.9999 was achieved with this curve.

4. Matrix Spike

A matrix spike was run with each set of matrices. Percent recovery of the MS for the water samples was 84.8%, for soils, the MS recovery was 96.8% and the MS recovery for the oil sample was 105.5%.

5. Lab Duplicate

A lab duplicate was run with each set of matrices. The relative percent difference between the water sample and its duplicate was not calculated because they were reported to be less than the method detection limits. A 15% relative percent difference was calculated for the soil samples and 1.2% relative percent difference was reported for the oil sample.

Discussion

Sample DSX44301 was broken accidently by RECRA Environmental lab before any TPH analysis could be done on it. Therefore, there is no data available for this sample in this package. However, RECRA Environmental, Inc. did contact SMO with regards to this matter as mentioned in their memo and since there was a duplicate for that sample (DSX44301D) no action was taken by the EPA to re-sample.

All of the water samples were extracted using 1L from each sample. The TPHs were reported less than the method detection limits (<0.5 mg/L).

A sample weight of 20g was used for the soil samples and only a 0.5g was used for the oil sample with a dilution factor of 50.

Summary

From the evaluation of the QC mentioned above, this data meets the requirements for overall accuracy, precision and completeness.

ENVIRONMENTAL SERVICES ASSISTANCE TEAM – ZONE II

ICF Technology Incorporated

NSI Technology Services Corp.

The Bionetics Corp.

ESAT Region VII
NSI Technology Services
25 Funston Road
Kansas City, KS 66115
(913) 236-3881

MEMORANDUM

TO: Larry Marchin, Chemist, CLQA/LABO/ENSV
THRU: Harold Brown, Ph.D, DPO/LABO/ENSV

FROM: Peggy Cox, QA/QC Chemist/ESAT/MANTECH
THRU: Ronald Ross, Manager/ESAT/MANTECH

DATE: April 17, 1991

SUBJECT: Review of data for LACLEDE COAL GAS
TID#: 07-9103-535
ASSIGNMENT#: 760
ICF ACCT#: 302-26-535-02
MANTECH S.O.#: 1073-535
ESAT DOCUMENT#: ESAT-VII-535-0008

These data were reviewed according to the "Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses," July 1, 1988 revision.

The following comments and attached data sheets are a result of ManTech Environmental Technology, Inc.'s review of the above mentioned data from the contract laboratory.

CASE/SAS NO.: 15978
CONTRACT NO.: 68-D0-0108
SITE: LACLEDE COAL GAS
REVIEWER: P. COX

LABORATORY: SKINER
METHOD NO.: CS0390I
EPA ACTIVITY: DSX44
MATRIX: WATER

SMO SAMPLE NO.	EPA SAMPLE NO.
MGH515	DSX44201
MGH517	DSX44202
MGH519	DSX44301
MGH521	DSX44301D
MGH523	DSX44302
MGH525	DSX44304
MGH527	DSX44304D
MGH529	DSX44900P

GENERAL

Case 15978 contained 8 environmental and 6 QC water samples analyzed for total metals and cyanide at the low level concentration. No field blank, two field duplicates, and one performance evaluation sample were included in this data review assignment. Data review was performed at level 2.

1. **TECHNICAL HOLDING TIMES and PRESERVATION**

A. Technical holding times and required preservation were within quality control limit requirements.

2. **INITIAL and CONTINUING CALIBRATION**

A. Initial and continuing calibrations were within quality control limit requirements.

3. **BLANKS**

A. No analytes were detected above the contract required detection limit (CRDL) in any blank.

B. Levels of analytes greater than the instrument detection limit (IDL) were detected for aluminum (Al), barium (Ba), calcium (Ca), cadmium (Cd), iron (Fe), nickel (Ni), silver (Ag), and zinc (Zn). Analytes greater than the instrument detection limit (IDL) but less than 5 times the highest level detected in the blank were qualified with a "U" code. Cadmium (Cd) in sample DSX44900P and zinc (Zn) in samples DSX44301, DSX44301D, and DSX44302 were qualified with a "U" code according to the blank rules.

4. **ICP INTERFERENCE CHECK**

A. All analytes contained in the ICP interference check sample were within quality control limit requirements. Antimony (Sb), potassium (K), and sodium (Na) were found but not elements present in the AB ICP interference check solution. Since levels detected were below the intrument detection limit (IDL) or levels found in the samples were significantly higher, no data were qualified by the ICP interference check sample.

5. **LABORATORY CONTROL SAMPLE**

A. All laboratory control samples analyzed were within quality control limit requirements.

6. DUPLICATES

A. All analytes were within quality control limit requirements except aluminum (Al) and cyanide (CN^-). Aluminum (Al) in samples DSX44201, DSX44202, DSX44301, DSX44301D, DSX44302, DSX44304, DSX44304D, DSX44202S, and DSX44901C and cyanide (CN^-) in samples DSX44201, DSX44202, DSX44304D, DSX44900P, and DSX44202S were qualified with a "J" code according to the duplicate rules.

7. MATRIX SPIKE

A. All analytes were within quality control limit requirements for percent recovery except selenium (Se) and thallium (Tl). Selenium had a 0.0% recovery due to the original sample being diluted. No samples were qualified for selenium (Se) but thallium (Tl) in sample DSX44901C was qualified with a "J" code according to the spike rules.

8. GRAPHITE FURNACE ATOMIC ABSORPTION (GFAA) SPECTROSCOPY

A. All quality control limit requirement criteria for graphite furnace atomic absorption (GFAA) spectroscopy were met. Selenium (Se) and thallium (Tl) in several samples had post digestion spike recoveries outside quality control limits, but since the results were non-detect, no data were qualified.

B. The method of standard additions was performed for arsenic (As) and selenium (Se) in sample DSX44900P and lead (Pb) in sample DSX44202. The correlation coefficient for lead (Pb) in sample DSX44202 and selenium (Se) in sample DSX44900P was outside quality control limit requirements (less than 0.995) and were qualified with a "J" code according to the standard addition rules.

9. PERFORMANCE EVALUATION AUDIT SAMPLE

A. Performance evaluation audit sample DSX44900P was submitted to the laboratory for analysis with all analytes containined in the audit being identified.

10. ICP SERIAL DILUTION

A. All analytes were within quality control limit requirements except copper (Cu). Copper (Cu) in samples DSX44201, DSX44202, DSX44202S, DSX44201L, and DSX44901C were qualified with a "J" code according to the ICP serial dilution rules.

11. SUMMARY

A. Cadmium (Cd) in sample DSX44900P and zinc (Zn) in samples DSX44301, DSX44301D, and DSX44302 were qualified with a "U" code due to blank contamination.

B. Aluminum (Al) in samples DSX44201, DSX44202, DSX44301, DSX44301D, DSX44302, DSX44304, DSX44304D, DSX44202S, and DSX44901C and cyanide (CN^-) in samples DSX44201, DSX44202, DSX44304D, DSX44900P, and DSX44202S were qualified with a "J" code due to poor duplicate precision.

C. Thallium (Tl) in sample DSX44901C was qualified with a "J" code due to poor spike recovery.

D. Lead (Pb) in sample DSX44202 and selenium (Se) in sample DSX44900P were qualified with a "J" code according to the standard addition rules.

E. Copper (Cu) in samples DSX44201, DSX44202, DSX44202S, DSX44201L, and DSX44901C were qualified with a "J" code according to the ICP serial dilution rules.

F. Several compounds were "U" coded due to the compound concentrations being greater than the instrument detection limit (IDL) but less than the contract required detection limit (CRDL).

G. This data package generally meets the requirements for precision, accuracy, and completeness as described in SOW for Inorganic Analysis dated March 1990, with the exceptions noted above.

ENVIRONMENTAL SERVICES ASSISTANCE TEAM – ZONE II

ICF Technology Incorporated

NSI Technology Services Corp.

The Bionetics Corp.

ESAT Region VII
NSI Technology Services
25 Funston Road
Kansas City, KS 66115
(913) 236-3881

MEMORANDUM

TO: Larry Marchin, Chemist, CLQA/LABO/ENSV
THRU: Harold Brown, Ph.D, DPO/LABO/ENSV

FROM: Peggy Cox, QA/QC Chemist/ESAT/MANTECH PC for KL
THRU: Ronald Ross, Manager/ESAT/MANTECH

DATE: April ~~19~~ 23, 1991

SUBJECT: Review of data for LACLEDE COAL GAS
TID#: 07-9103-535
ASSIGNMENT#: 761
ICF ACCT#: 302-26-535-02
MANTECH S.O.#: 1073-535
ESAT DOCUMENT#: ESAT-VII-535-0010

These data were reviewed according to the "Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses," July 1, 1988 revision.

The following comments and attached data sheets are a result of ManTech Environmental Technology, Inc.'s review of the above mentioned data from the contract laboratory.

CASE/SAS NO.: 15978
CONTRACT NO.: 68-D0-0108
SITE: LACLEDE COAL GAS
REVIEWER: P. COX

LABORATORY: SKINER
METHOD NO.: CS0390I
EPA ACTIVITY: DSX44
MATRIX: WATER

SMO SAMPLE NO.	EPA SAMPLE NO.
MGH516	DSX44201
MGH518	DSX44202
MGH520	DSX44301
MGH522	DSX44301D
MGH524	DSX44302
MGH526	DSX44304
MGH528	DSX44304D
MGH530	DSX44900P

GENERAL

Case 15978 contained 8 environmental and 6 QC water samples analyzed for dissolved metals at the low level concentration. No field blank, two field duplicates, and one performance evaluation sample were included in this data review assignment. Data review was performed at level 2.

1. TECHNICAL HOLDING TIMES and PRESERVATION

A. Technical holding times and required preservation were within quality control limit requirements.

2. INITIAL and CONTINUING CALIBRATION

A. Initial and continuing calibrations were within quality control limit requirements.

3. BLANKS

A. No analytes were detected above the contract required detection limit (CRDL) in any blank.

B. Levels of analytes greater than the instrument detection limit (IDL) were detected for barium (Ba), calcium (Ca), copper (Cu), and zinc (Zn). Analytes greater than the instrument detection limit (IDL) but less than 5 times the highest level detected in the blank were qualified with a "U" code. Since all associated data were non-detect, no data were qualified by the blank rules.

4. ICP INTERFERENCE CHECK

A. All analytes contained in the ICP interference check sample were within quality control limit requirements. Antimony (Sb), potassium (K), and sodium (Na) were found but not elements present in the AB ICP interference check solution. Since levels detected were below the intrument detection limit (IDL) or levels found in the samples were significantly higher, no data were qualified by the ICP interference check sample.

5. LABORATORY CONTROL SAMPLE

A. All laboratory control samples analyzed were within quality control limit requirements.

6. **DUPLICATES**

A. All analytes were within quality control limit requirements except lead (Pb). Lead (Pb) in samples DSX44201, DSX44301D, DSX44900P, DSX44201S, and DSX44903C were qualified with a "J" code according to the duplicate rules.

7. **MATRIX SPIKE**

A. All analytes were within quality control limit requirements for percent recovery except selenium (Se) and thallium (Tl). Selenium (Se) in samples DSX44900P and DSX44903C and thallium (Tl) in sample DSX44903C were qualified with a "J" code according to the spike rules.

8. **GRAPHITE FURNACE ATOMIC ABSORPTION (GFAA) SPECTROSCOPY**

A. All quality control limit requirement criteria for graphite furnace atomic absorption (GFAA) spectroscopy were met. Selenium (Se) and thallium (Tl) in several samples had post digestion spike recoveries outside quality control limits, but since the results were non-detect, no data were qualified.

B. The method of standard additions was performed for arsenic (As) in sample DSX44202. The correlation coefficient for arsenic (As) in sample DSX44202 was outside quality control limit requirements (less than 0.995) and was qualified with a "J" code according to the standard addition rules.

9. **PERFORMANCE EVALUATION AUDIT SAMPLE**

A. Performance evaluation audit sample DSX44900P was submitted to the laboratory for analysis with all analytes containined in the audit being identified.

10. **ICP SERIAL DILUTION**

A. All analytes were within quality control limit requirements except iron (Fe). Iron (Fe) in samples DSX44201, DSX44202, DSX44201S, DSX44201L, and DSX44903C were qualified with a "J" code according to the ICP serial dilution rules.

11. **SUMMARY**

A. Lead (Pb) in samples DSX44201, DSX44301D, DSX44900P, DSX44201S, and DSX44903C were qualified with a "J" code due to poor duplicate precision.

B. Selenium (Se) in samples DSX44900P and DSX44903C and thallium (Tl) in sample DSX44903C were qualified with a "J" code due to poor spike recovery.

C. Arsenic (As) in sample DSX44202 was qualified with a "J" code according to the standard addition rules.

D. Iron (Fe) in samples DSX44201, DSX44202, DSX44201S, DSX44201L, and DSX44903C were qualified with a "J" code according to the ICP serial dilution rules.

E. Several compounds were "U" coded due to the compound concentrations being greater than the instrument detection limit (IDL) but less than the contract required detection limit (CRDL).

F. This data package generally meets the requirements for precision, accuracy, and completeness as described in SOW for Inorganic Analysis dated March 1990, with the exceptions noted above.

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To: Larry Marchin & Barry Evans
Data Review Task Monitors
Thru: Harold Brown, Ph.D.
ESAT Deputy Project Officer, EPA
From: Janet Muse
Senior Scientist, ESAT
Thru: Ronald A. Ross
Region VII ESAT Team Leader, Mantech

Date: April 26, 1991
Subject: Review of organic data for Laclede Coal Gas
ASGN #: 777
TID #: 07-9103-535
ICF Acct. #: 302-26-535-02
ManTech Sales Order : 1073-535
ESAT Doc. Control #:..... ESAT-VII-535-0024

These data were reviewed according to the "Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses," and the Region VII Organic Data Review Training Manual as guidance. The following comments and attached data sheets are a result of the ESAT review of the above mentioned data from the contract laboratory.

Hi. Conc 9/88

CASE NO.: 15978
SITE: Laclede Coal Gas
REVIEWER: J. MUSE
MATRIX: Oil

LABORATORY: EIRA
METHOD NO.: CS03900
EPA ACTIVITY NO.: DSX44

Sample No.	EPA Sample No.
GJ894	DSX44501

And QC samples DSX44919M, 919G, and 919H.

General

This data review assignment covers ONE OIL sample analyzed for High Concentration volatile organics and extractables SOW 9/88. No field blanks or field duplicates, and 4 QC samples were included in this assignment. The organic traffic report was present.

1. Holding Times and Preservation

There are no holding time requirements for volatile organics in oil samples.

Preservation of samples was refrigeration at 4 degrees C and protection from light.

2. GC/MS Performance

All CLP criteria for GC/MS performance were met for a 50 nanogram injection of 4-bromofluorobenzene.

All CLP criteria for GC/MS performance were met for a 50 nanogram injection of DFTPP.

3. Method Blanks

Positive hits for target compounds in the blanks were only reported positive in the sample after the blank rule was applied. That is, positive hits for methylene chloride in the sample were reported and coded with a "U" unless they were greater than 10-times the level in the daily blank. Methylene chloride was reported in the VOC method blank. No target compounds for the extractables were found in the method blank.

4. Initial Calibration

VOCS: All response factors met applicable criteria. All compounds met the 35% criteria for RSD.

Extractables: A three point initial calibration was done before analysis of the samples. All response factors met applicable criteria. All compounds met the 35% criteria for RSD.

5. Continuing Calibration

VOCS: The sample and QC samples were analyzed the same day of the initial calibration, so no continuing calibration std. needed to be run.

Extractables: All compounds were within the 25% difference criteria for response factors on the continuing calibration of 3/29/91, except for a few target compounds. Since no positive hits were found for these outliers in the sample, no data was qualified due to the continuing calibration.

6. Surrogate Recoveries

VOCS: Surrogate recoveries were within control limits in all cases.

Extractables: Surrogates were diluted out of the sample due to large quantities of target compounds. No data were qualified due to this.

7. Internal Standard Areas

VOCS: Met applicable criteria.

Extractables: Perylene-d12 and chrysene-d12 were less then the lower limit criteria in the method blank. No data was qualified due to this.

8. **Control Matrix Spike**

A control matrix spike was done for both parameters, VOCS and extractables. Recoveries were within control limits for both control matrix spikes.

Summary

This data package mets acceptability in terms of the requirements for overall accuracy, precision and completeness.

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THRU: Harold Brown, Ph.D., ESAT Contract Manager/ENSV

FROM: Rebecca K. Estep, ESAT Data Reviewer/ManTech RE RE
THRU: Albert Iannacone, ESAT QA/QC Coordinator/ManTech

DATE: April 29, 1991
SUBJECT: Review of organic data for Laclede Coal Gas.

TID#:	07-9103-535
ASSIGNMENT#:	769
ICF ACCT#:	302-26-535-02
ManTech S.O.#:	1073-535
ESAT Document#:	ESAT-VII-535-0014

These data were reviewed according to the "Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses," February 1, 1988 revision.

The following comments and attached data sheets are a result of ManTech Environmental Technology, Inc.'s review of the above mentioned data from the contract laboratory.

CASE NO.:	15978	LABORATORY:	RECMD
CONTRACT NO.:	68-D0-0158	METHOD NO:	CS03900
SITE:	Laclede Coal Gas	EPA ACTIVITY:	DSX44
REVIEWER:	Rebecca K. Estep	MATRIX:	Soil

Samples for Semivolatile Analysis

SMO SAMPLE NO.	EPA SAMPLE NO.	SMO SAMPLE NO.	EPA SAMPLE NO.
GJ879	DSX44108	GK983	DSX44002
GJ880	DSX44109	GK984	DSX44003
*GJ890	*DSX44401	GK985	DSX44004
*GJ891	*DSX44401D	GK986	DSX44005
*GJ892	*DSX44402	GK987	DSX44110
*GJ893	*DSX44403	GK988	DSX44111
GK982	DSX44001	GK989	DSX44112

* Also analyzed for volatiles.

GENERAL

Case 15978 contained low level soil samples for volatile and base/neutral and acid analyses. 14 samples for semivolatile analysis, 4 which were also analyzed for volatiles (18 actual;13 QC). This package includes no field blanks, one field duplicate, and no performance evaluation sample. Data review was performed at level 2.

1. TECHNICAL HOLDING TIMES and PRESERVATION

A. No technical holding times are specified for soil samples. All samples were within holding time specifications from extraction to analysis for base/neutral and acids.

2. GC/MS Tuning

A. All volatile GC/MS tunings and mass calibrations were within quality control limit requirements for bromofluorobenzene (BFB).

B. All base/neutral and acid GC/MS tunings and mass calibratons were within quality control limit requirements for decafluorotriphenylphosphine (DFTPP).

3. INITIAL and CONTINUING CALIBRATION

A. All average relative response factors and percent relative standard deviations were within quality control limit requirements for the volatile initial calibration.

B. Bromoform and 4-methyl-2-pentanone were outside quality control limit requirements for percent difference (%D) (greater than 25%) on the volatile continuing calibration dated 3/14/91. Since these compounds were non-detect in all samples no data were qualified by the calibration rules.

C. All average relative response factors and percent relative standard deviations were within quality control limit requirements for the base/neutral and acid initial calibrations except for the one dated 4/8/91 where 4-chlorophenyl-phenyl ether, fluorene, and bis(2-ethylhexyl)phthalate were outside the quality control limit requirements for percent relative standard deviation (%RSD) (greater than 30%). This resulted in fluorene being "J" coded in sample DSX44109, and bis(2-ethylhexyl)phthalate "J" coded in samples DSX44001, DSX44002, DSX44003, DSX44004, and DSX44005.

D. Several compounds (anywhere from 2 to 7) were outside quality control limit requirements for percent difference (%D) (greater than 25%) on the base/neutral and acid continuing calibrations. Pyrene was "J" coded in sample DSX44402 from the continuing calibration dated 4/3/91. Bis(2-ethylhexyl)phthalate would have been "J" coded in samples DSX44001, DSX44002, DSX44003, DSX44004, and DSX44005 from the continuing calibration dated 4/10/91, however this compound was previously "J" coded in these same 5 samples due to the initial calibration rules.

4. INTERNAL STANDARD RESPONSE

A. All internal standard response areas were within a factor of 2 when comparing samples and their associated continuing calibration response areas for volatile analysis.

B. The internal standard response areas were out by more than a factor of 2 between the samples and their associated continuing calibration response areas for base/neutral and acid analysis in sample DSX44108 and the reanalysis of DSX44108 for phenanthrene-d10 and chrysene-d12. DSX44108 was also out for perylene-d12. This resulted in carbazole being "J" coded for sample DSX44108.

5. BLANKS

A. One method blank was analyzed for the volatile fraction with acetone, methylene chloride, and 2-butanone detected. This resulted in methylene chloride and acetone being "U" coded in samples DSX44401D, DSX44402, DSX44401S, and DSX44401W, and only acetone in sample DSX44403 according to the blank rules. Methylene chloride and 2-butanone, in the method blank, were detected above the instrument detection limit (IDL) but less than the contract required quantitaion limit (CRQL), thus their results were raised to the CRQL and "U" coded.

B. Four method blanks were analyzed for the base/neutral and acid fraction with bis(2-ethylhexyl)phthalate detected in all 4 samples. No qualifications were made because the concentrations in all corresponding samples were greater than ten times the blank concentrations. In addition, butylbenzylphthalate was detected in sample DSX44924M and DSX44925M, and diethylphthalate and di-n-butylphthalate were detected in sample DSX44926M. Since these compounds were non-detect no data were qualified due to the blank rules.

6. SURROGATE RECOVERY

A. All surrogates were within quality control limit requirements for percent recovery for the volatile fraction except 1,2-dichloroethane-d4 in sample DSX44401W. No data were qualified due to the surrogate recovery rules.

B. All surrogates were within quality control limit requirements for percent recovery for the base/neutral and acid fraction except 2-fluorobiphenyl and terphenyl-d14 in sample DSX44108DL. Phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd) pyrene, and benzo(g,h,i)perylene were "J" coded in sample DSX44108 due to the fact that the concentrations for these base/neutral compounds were reported from the dilution and the dilution was qualified due to the surrogate rules. Terphenyl-d14 was also out for samples DSX44108 and DSX44108RE, however no data were qualified.

7. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A. A matrix spike/matrix spike duplicate was analyzed for volatiles with percent recovery and relative percent difference within quality control limit requirements.

B. A matrix spike/matrix spike duplicate was analyzed for the base/neutral and acid fraction with the percent recovery for pyrene low and the relative percent difference for acenaphthene and pyrene outside the advisory limits. No data were qualified due to the matrix spike/matrix spike duplicate rules.

8. PERFORMANCE EVALUATION SAMPLE

A. No performance evaluation sample was submitted to the laboratory for analysis associated with this case and SDG number.

9. COMPOUND IDENTIFICATION and QUANTITATION

A. All target compound identifications were supported by good agreement between sample and standard mass spectra submitted for each positive sample response.

B. Several compounds in all samples for both volatile and base/neutral and acid analyses were detected above the instrument detection limit (IDL) but below the contract required quantitation limit (CRQL). These results were raised to the CRQL and "U" coded.

10. SUMMARY

A. Samples DSX44401D, DSX44402, DSX44403, DSX44401S, and DSX44401W for volatile analysis detected methylene chloride and/or acetone which were "U" coded due to the blank rule.

B. Anthracene was "J" coded in sample DSX44108 due to the high concentration encountered in both the original analysis and the dilution which were detected above the calibration range.

C. Fluorene was "J" coded in sample DSX44109, and bis(2-ethylhexyl)phthalate was "J" coded in samples DSX44001, DSX44002, DSX44003, DSX44004, and DSX44005 due to the initial calibration rules.

D. Pyrene was "J" coded in sample DSX44402 due to the continuing calibration rules.

E. Carbazole was "J" coded in sample DSX44108 due to the internal standard rules.

F. Several compounds in all samples for volatile and base/neutral and acid analyses were detected above the IDL but less than the CRQL, thus these compounds were raised to the CRQL and "U" coded.

G. Phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd) pyrene, and benzo(g,h,i)perylene were "J" coded in sample DSX44108 due to the surrogate rules.

H. This data package generally meets the requirements for precision, accuracy, and completeness as described in SOW for Organic Analysis dated March 1990, with the exceptions noted above.

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THRU: Harold Brown, Ph.D.
ESAT Deputy Project Officer, EPA

FROM: Paula Woodland PW
ESAT Scientist
THRU: Ronald A. Ross
ESAT Team Manager

DATE: April 29, 1991
SUBJECT: Review of VOA/BNA data for Laclede Coal Gas

TID# 07-9103-535
ASSIGNMENT# 768
ICF ACCT# 26-535-02
ManTech S.O.# 1073-535
ESAT Document #: ESAT-VII-535-0013

These data were reviewed primarily according to the Special Analytical Services Request and the "Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses," February 1988 revision with changes given in the Region VII Organic Data Review Training Manual and EPA memorandums and the 3/90 SOW.

The following comments and attached data sheets are a result of the ESAT review, according to EPA policies, of the following data from the contract laboratory.

CASE NO.: 15978
SITE: Laclede Coal Gas
REVIEWER: Paula Woodland

LABORATORY: RECMD
METHOD NO.: CS03900
EPA ACTIVITY NO.: DSX44
MATRIX: SOIL

VOA

SMO Sample No.	EPA Sample No.	SMO Sample No.	EPA Sample No.
GJ859	DSX44001	GJ865	DSX44007
GJ860	DSX44002	GJ866	DSX44008
GJ861	DSX44003	GJ867	DSX44009
GJ862	DSX44004	GJ868	DSX44010
GJ863	DSX44005	GJ869	DSX44011
GJ864	DSX44006	GJ870	DSX44012
		GJ871	DSX44013

BNA

SMO Sample No.	EPA Sample No.	SMO Sample No.	EPA Sample No.
GJ864	DSX44006	GJ872	DSX44101
GJ865	DSX44007	GJ873	DSX44102
GJ866	DSX44008	GJ874	DSX44103
GJ867	DSX44009	GJ875	DSX44104
GJ869	DSX44011	GJ876	DSX44105
GJ870	DSX44012	GJ877	DSX44106
GJ871	DSX44013	GJ878	DSX44107

GENERAL

This data review assignment covers 12 SOIL samples analyzed for VOA and 14 SOIL samples analyzed for BNA. There were no field blanks, duplicates, or performance evaluation samples included with this assignment. DSX44010 (GJ868) was originally sent along with this SDG number, however SMO removed the sample to another SDG number because the matrix was defined incorrectly.

1. Holding Times and Preservation

VOA: Technical holding times have not been established for soil samples.

BNA: Collection to extraction holding times have not been established for soil samples, however the extraction to analysis holding times were within the established criteria.

2. GC/MS Tuning

All relative ion abundances were within the established control limits of the 3/90 SOW for both VOA and BNA analysis.

3. Initial and Continuing Calibration

VOA: The %RSD was out of control for acetone in the initial calibration curve ran on 1/8/91. All positive results for this compound in samples DSX44005 and DSX44913M were coded J. All criteria were within the established control limits for the other initial calibration curve. The %D was out of control for several compounds in the continuing calibration check, however no other samples were coded.

BNA: All criteria were within established control limits for the initial calibration curve. The %D was out of control for pyrene and several other compounds on 3-22-91, 3-26-91, and 3-28-91. All positive results for pyrene in samples DSX44007, -009, -011, -101S, and -101W were coded J.

4. **Internal Standard Response**

VOA: The internal standard area was out of control for chlorobenzene-d^5 in sample DSX44012 and the re-analysis of DSX44012. The positive result for the corresponding compound, styrene, in DSX44012 was coded J. The original analytical result was reported because the internal standard response was slightly better than the re-analysis. All other internal standard criteria were within control limits.

BNA: The internal standard area was out of control for naphthalene-d^8 in sample DSX44008 and the re-analysis, but only non-detect compounds were reported from these injections so no coding was performed. The internal standard response was within the established criteria for the dilution of DSX44008 so the diluted results for naphthalene and 2-methylnaphthalene were not coded. All other internal standard criteria were within control limits.

5. **Blanks**

VOA: Methylene chloride and acetone were detected in the blanks. Corresponding sample results were qualified according to the blank rule using ten times the highest blank value. Acetone was qualified in samples DSX44001, -002, -003, -004, -012, and -001S. Methylene chloride was qualified in samples DSX44001, -002, -001S, and -001W.

BNA: Bis(2-ethylhexyl)phthalate was detected in the blanks, however no qualifications were performed.

6. **Surrogate Recovery**

The surrogate compound recoveries were within established control limits.

7. **Matrix Spike/Matrix Spike Duplicate Recovery**

VOA: Matrix spike/matrix spike duplicate criteria were within established control limits.

BNA: The % recovery of the medium level soil matrix spike and matrix spike duplicate was out of control for 6 and 2 of the 11 compounds, respectively. The %RPD was out of control for 3 of the 11 compounds. No coding was performed. A low level matrix spike and matrix spike duplicate from a different SDG# (GJ879) was included in this SDG# GJ859 for the one low level sample (DSX44106). This was not evaluated because it was from another case.

8. Compound Identification and Quantitation

Due to the requested review level, results listed on the summary forms were used for the review. These results were not checked against the raw data for accuracy, and calculations were not verified.

VOA: Xylene was coded J in sample DSX44008 because it was detected over the calibration range. A re-analysis was not performed by the lab.

BNA: For DSX44008, nine compounds were over the calibration range so a dilution was made. In this dilution, seven of the nine compounds were below the CRQL. These seven compounds were reported using the original undiluted results and coded J for exceeding the calibration range. The seven compounds that were coded J in DSX44008 were fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, and chrysene.

9. Summary

VOA: Acetone was coded J for sample DSX44012 because the internal standard response was too low. Also, acetone was coded J for samples DSX44005 and -913M because of an initial calibration %RSD outlier. Xylene was coded J for sample DSX44008 because it was over the calibration range. Several samples were qualified by the blank rule for methylene chloride and acetone.

BNA: Pyrene was coded J for samples DSX44007, -009, -011, -101S, and -101W because the %D was outside of control limits for the corresponding continuing calibration standard. An improper dilution was made for sample DSX44008 which resulted in the coding of several compounds (see Compound Identification and Quantitation section above). A low level soil matrix spike and matrix spike duplicate was not included with this SDG number.

The EPADA data sheets are attached. This data review is complete. If you have any questions, please contact me.

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THRU: Harold Brown, Ph.D.
ESAT Deputy Project Officer, EPA

FROM: Kevin Ludwikoski
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THRU: Ronald A. Ross
ESAT Team Manager

DATE: April 29, 1991
SUBJECT: Review of inorganic data for Laclede Coal Gas Co.

TID# 07-9103-535
ASSIGNMENT# 762
ICF ACCT# 302-26-535-02
ManTech S.O.# 1073-535
ESAT Document No. ESAT-VII-535-0025

These data were reviewed primarily according to the "Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses," July 1988 revision with changes given in the Region VII Inorganic Data Review Training Manual and EPA memorandums.

The following comments and attached data sheets are a result of the ESAT review, according to EPA policies, of the following data from the contract laboratory.

CASE NO.: 15978
SITE: Laclede Coal Gas Co.
REVIEWER: Kevin Ludwikoski

LABORATORY: SKINER
METHOD NO.: CS0390I
EPA ACTIVITY NO.: DSX44
MATRIX: WATER/SOIL

TOTAL METALS and CN
(SOIL)

SMO Sample No.	EPA Sample No.	SMO Sample No.	EPA Sample No.
MGG558	DSX44006	MGG568	DSX44103
MGG559	DSX44007	MGG569	DSX44104
MGG560	DSX44008	MGG570	DSX44105
MGG561	DSX44009	MGG571	DSX44106
MGG562	DSX44010	MGG572	DSX44107
MGG563	DSX44011	MGG573	DSX44108
MGG564	DSX44012	MGG574	DSX44109
MGG565	DSX44013	MGG590	DSX44401
MGG566	DSX44101	MGG591	DSX44401D
MGG567	DSX44102	MGG592	DSX44402

DISSOLVED METALS
(WATER)

SMO Sample No.	EPA Sample No.
MGG576	DSX44203
MGG578	DSX44204
MGG583	DSX44206D
MGG585	DSX44207F
MGG587	DSX44208
MGG589	DSX44303

GENERAL

This data review assignment covers SIX WATER samples analyzed for DISSOLVED METALS and TWENTY SOIL samples analyzed for TOTAL METALS and CYANIDE for case number 15978. There was one field blank and one field duplicate for Dissolved Metals and one field duplicate for Total Metals and Cyanide included with this assignment.

1. **Technical Holding Times / Preservation**

A. Technical holding times were observed for all analytes.

B. Technical holding times are not specified for soil samples.

2. **Initial and Continuing Calibration**

A. All percent recoveries were within control limits for water samples.

B. All percent recoveries were within control limits for soil samples.

3. **Blanks**

A. Several analytes were detected in the blanks. Corresponding sample results were qualified according to the blank rule using five times the highest blank value. Sample results requiring modification are reported as non-detect on the attached data sheets.

DISSOLVED METALS
(WATER)

Analyte	5 x Highest Blank (µg/L)	Qualified Samples
Al	186	None qualified
Ca	1360	None qualified
Cu	24	None qualified
Fe	180	DSX44208
Pb	11	DSX44203, -204, -206D, -203L
Mg	372	None qualified
Na	1055	None qualified
V	14	None qualified
Zn	49	None qualified
Mn	9	None qualified

3. **Blanks (cont.)**

B. TOTAL METALS and CN (SOILS)

Analyte	5 x Highest Blank (mg/kg)	Qualified Samples
Al	30	None qualified
Sb	20	None qualified
Ba	2.4	None qualified
Ca	60	None qualified
Co	3.3	None qualified
Cu	2.8	None qualified
Fe	26	None qualified
Mg	66	None qualified
Mn	6.6	None qualified
Na	78	None qualified
Zn	3.3	None qualified

4. **ICP Interference Check**

A. Recoveries of solution AB analytes were within control limits for Dissolved Metals. Sb, K, and Na were found but not present in the ICS solution. All absolute values for these analytes were below the CRDL and IDL; therefore, no data were qualified by the ICP interference check sample.

B. Recoveries of solution AB analytes were within control limits for Total Metals and Cyanide. Sb, K, and Na were found but not present in the ICS solution. All absolute values for these analytes were below the CRDL and IDL; therefore, no data were qualified by the ICP interference check sample.

5. **Laboratory Control Standard (LCS)**

A. LCS results were within established control limits for Dissolved Metals.

B. LCS results were within established control limits for Total Metals and CN.

6. Duplicates

A. The RPD for all analytes were within control limits for Dissolved Metals.

B. The RPD for Pb exceeded control limits for Total Metals. The sample results that were coded J are listed below.

TOTAL METALS and CN
(SOIL)

Analyte	Samples Qualified	Code
Pb	DSX44006-013, DSX44101-109, -401, -401D -401S, -402, -922C	J

7. Matrix Spike Sample

A. Se and Tl were out of range for matrix spike recovery for Dissolved Metals. The samples that had data qualified are listed below.

DISSOLVED METALS
(WATER)

Analyte	% Rec	Sample No.	Code
Se	45.6	DSX44303, -921C	J
Tl	34.1	DSX44921C	J

B. Sb was out of range for matrix spike recovery for Total Metals. The samples that had data qualified are listed below.

TOTAL METALS and CN
(SOIL)

Analyte	% Rec	Sample No.	Code
Sb	37.5	DSX44921C	J

8. ICP Serial Dilution

A. The ICP serial dilution results for Zn were outside control limits for Dissolved Metals. The samples that had results qualified are listed below.

DISSOLVED METALS
(WATER)

Analyte	Samples Qualified	Code
Zn	DSX44203, -204, -206D, -204S, -203L, -921C	J

B. The ICP serial dilution results for Zn were outside control limits for Total Metals. The samples that had results qualified are listed below.

TOTAL METALS and CN
(SOIL)

Analyte	Samples Qualified	Code
Zn	DSX44006, -007, -008, -009, -010, -011, -012, -013, -101, -102, -103, -104, -105, -106, -107, -108, -109, -401, -401D, -401L, -401S, -402, -922C	J

9. Furnace Atomic Absorption

A. The analytical scheme was followed for Furnace AA analysis for Dissolved Metals. MSA correlation coefficients were acceptable for As in sample DSX44206D (cc=.9987) and for Se in sample DSX44303 (cc=.9964).

B. The analytical scheme was followed for Furnace AA analysis for Total Metals. MSA correlation coefficients were not acceptable for Se in samples DSX44103, -401L, -401D, and -402 (best cc=.9869, .9878, .9565, and .9800 respectively). Only sample DSX44402 had Se found above the CRDL, and was "J" coded accordingly.

10. Summary

A. Nine analytes were qualified by the blank rule, one by the the spike rule, and one analyte was qualified by serial dilution outliers.

B. Eleven analytes were qualified by the blank rule, one by the spike rule, one by the duplicate rule, one by the serial dilution rule, and one analyte in one sample was "J" coded due to the rules of standard additions.

ENVIRONMENTAL SERVICES ASSISTANCE TEAM -- ZONE II

ICF Technology Incorporated
NSI Technology Services Corp.
The Bionetics Corp.

ESAT Region VII
NSI Technology Services
25 Funston Road
Kansas City, KS 66115
(913) 236-3881

TO: Larry Marchin/Barry Evans
Data Review Task Monitor

THRU: Harold Brown, Ph.D.
ESAT Deputy Project Officer, EPA

FROM: Kevin Ludwikoski
ESAT Data Reviewer

THRU: Ronald A. Ross
ESAT Team Manager

DATE: May 2, 1991
SUBJECT: Review of inorganic data for Laclede Coal Gas Co.

TID# 07-9103-535
ASSIGNMENT# 772
ICF ACCT# 302-26-535-02
ManTech S.O.# 1073-535
ESAT Document No. ESAT-VII-535-0017

These data were reviewed primarily according to the "Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses," July 1988 revision with changes given in the Region VII Inorganic Data Review Training Manual and EPA memorandums.

The following comments and attached data sheets are a result of the ESAT review, according to EPA policies, of the following data from the contract laboratory.

CASE NO.: 15978
SITE: Laclede Coal Gas Co.
REVIEWER: Kevin Ludwikoski

LABORATORY: SKINER
METHOD NO.: CS0390I
EPA ACTIVITY NO.: DSX44
MATRIX: SOIL

TOTAL METALS and CN
(SOIL)

SMO Sample No.	EPA Sample No.	SMO Sample No.	EPA Sample No.
MGG593	DSX44403	MGH535	DSX44005
MGH531	DSX44001	MGH536	DSX44110
MGH532	DSX44002	MGH537	DSX44111
MGH533	DSX44003	MGH538	DSX44112
MGH534	DSX44004		

GENERAL

This data review assignment covers NINE SOIL samples analyzed for TOTAL METALS and CYANIDE for case number 15978. There were no field blanks, field duplicates or PE samples included with this assignment.

1. **Technical Holding Times / Preservation**

Technical holding times have not been specified for soils.

2. **Initial and Continuing Calibration**

All percent recoveries were within control limits.

3. **Blanks**

Several analytes were detected in the blanks. Corresponding sample results were qualified according to the blank rule using five times the highest blank value. Sample results requiring modification are reported as non-detect on the attached data sheets.

TOTAL METALS and CN
(SOIL)

Analyte	5 x Highest Blank (mg/kg)	Qualified Samples
Sb	20	DSX44111
Ag	5	None qualified
Ca	15	None qualified
Cu	7	None qualified
Pb	2.2	None qualified
Mg	32	None qualified
Na	65	None qualified
Zn	9	None qualified

4. **ICP Interference Check**

Recoveries of solution AB analytes were within control limits. Sb, K, Zn, and Na were found but not present in the ICS solution. All absolute values for these analytes were below the CRDL and IDL; therefore, no data were qualified by the ICP interference check sample.

5. **Laboratory Control Standard (LCS)**

LCS results were within established control limits.

6. Duplicates

The RPD for Pb exceeded control limits. The sample results that were coded J are listed below.

TOTAL METALS and CN
(SOIL)

Analyte	Samples Qualified	Code
Pb	DSX44001, -002, -003, -004, -005, -110 -111, -112, -403, -403S, -928C	J

7. Matrix Spike Sample

Sb and Mn were out of range for matrix spike recovery. The samples that had data qualified are listed below.

TOTAL METALS and CN
(SOIL)

Analyte	% Rec	Sample No.	Code
Sb	41.5	DSX44928C	J
Mn	260.8	DSX44001, -002, -003, -004, -005, -110 -111, -112, -403, -403L, -928C	J

Note: Sb in sample DSX44111 was above CRDL, but had been previously "U" coded by the blank rule.

8. ICP Serial Dilution

The ICP serial dilution results were within control limits for all analytes of interest.

9. Furnace Atomic Absorption

The analytical scheme was followed for Furnace AA analysis. MSA correlation coefficients were not acceptable for Se in samples DSX44002, -003, -004, -110, -112 and -403L. Samples DSX44003 and -004 were below the CRDL and therefore not affected. The other samples were "J" coded accordingly.

10. Summary

One analyte in one sample was qualified by the blank rule, one analyte by the duplicate rule, two by the spike rule and four samples had Se "J" coded due to standard addition outliers.

ENVIRONMENTAL SERVICES ASSISTANCE TEAM -- ZONE II

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MEMORANDUM

TO: Larry Marchin, Chemist, CLQA/LABO/ENSV
THRU: Harold Brown, Ph.D, DPO/LABO/ENSV

FROM: Peggy Cox, QA/QC Chemist/ESAT/ManTech
THRU: Ronald Ross, Manager/ESAT/ManTech

DATE: May 2, 1990

SUBJECT: Review of data for LACLEDE COAL GAS
TID#: 07-9103-535
ASSIGNMENT#: 767
ICF ACCT#: 302-26-535-02
NSI S.O.#: 1073-535
ESAT DOCUMENT#: ESAT-VII-535-0018

These data were reviewed according to the "Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses," February 1, 1988 revision and the "Laboratory Data Validation Functional Guidelines for Evaluating Pesticides and PCBs."

The following comments and attached data sheets are a result of ManTech Environmental Technology, Inc.'s review of the above mentioned data from the contract laboratory.

CASE/SAS NO.: 15978
CONTRACT NO.: 68-D0-0158
SITE: LACLEDE COAL GAS
REVIEWER: P. COX

LABORATORY: RECMD
METHOD NO.: CS0390O
EPA ACTIVITY: DSX44
MATRIX: WATER

SMO SAMPLE NO.	EPA SAMPLE NO.	SMO SAMPLE NO.	EPA SAMPLE NO.
GJ881	DSX44203	GK958	DSX44201
GJ882	DSX44204	GK959	DSX44202
**GJ883	**DSX44205	GK960	DSX44301
GJ884	DSX44206	GK961	DSX44301D
GJ885	DSX44206D	GK962	DSX44302
GJ886	DSX44207F	GK963	DSX44304
**GJ887	**DSX44208	GK964	DSX44304D
*GJ888	*DSX44209F	GK965	DSX44900P
GJ889	DSX44303	GJ868	DSX44010

* Volatile analysis only.
** Rinsate blanks.

GENERAL

Case 15978 contained 18 water environmental and 18 QC samples analyzed for volatiles and base/neutrals and acids at the low level concentration. Two field blanks, three field duplicates, and one performance evaluation sample were included in this data review assignment. Data review was performed at level 2.

1. **TECHNICAL HOLDING TIMES and PRESERVATION**

A. Technical holding times for volatile analyses were exceeded by 3-6 days for aromatic compounds in samples DSX44209F, DSX44303, and DSX44010 and all compounds by 16 days in samples DSX44206RE and DSX44206DRE. Benzene, ethylbenzene, and total xylenes in sample DSX44010 were qualified with a "J" code according to the holding time/preservation rules.

B. Technical extraction and analysis holding times and required preservation were within quality control limit requirements on all samples for base/neutral and acid analyses.

2. **GC/MS TUNING**

A. All volatile GC/MS tunings and mass calibrations were within quality control limit requirements for bromofluorobenzene (BFB).

B. All base/neutral and acid GC/MS tunings and mass calibration were within quality control limit requirements for decafluorotriphenylphosphine (DFTPP).

3. **INITIAL and CONTINUING CALIBRATION**

A. Acetone, 2-butanone, 4-methyl-2-pentanone, and 2-hexanone were outside quality control limit requirements for percent relative standard deviation (greater than 30%) on the initial volatile calibrations. Since all associated data were non-detect or qualified by other rules, no data were qualified based on the initial calibration rules.

B. Acetone, 2-butanone, trans-1,3-dichloropropene, 4-methyl-2-pentanone, 2-hexanone, and carbon disulfide were outside quality control limit requirements for percent difference (%D) (greater than 25%) on the volatile continuing calibrations. Acetone in sample DSX44908M was qualified with a "J" code based on the continuing calibration rules.

C. 2,4-dinitrophenol, 4-nitrophenol, pentachlorophenol, butylbenzylphthalate, bis(2-ethylhexyl)phthalate, di-n-octyl phthalate, hexachlorocyclopentadiene, 4,6-dinitro-2-methyl phenol, pyrene, and butylbenzylphthalate were outside quality control limit requirements for percent difference (%D) (greater than 25%) on the base/neutral and acid continuing calibrations. 4-nitrophenol and bis(2-ethylhexyl)phthalate in sample DSX44900P and pyrene in sample DSX44010 were qualified with a "J" by the calibration rules.

D. All compounds were within quality control limit requirements for average relative response factor and response factor on the volatile and base/neutral and acid initial and continuing calibrations.

4. INTERNAL STANDARD RESPONSE

A. All internal standard response areas were within a factor of 2 when comparing samples and their associated continuing calibration response areas.

5. BLANKS

A. Six method blanks were analyzed for the volatile fraction with methylene chloride and acetone reported at levels greater than the instrument detection limit (IDL) but less than the contract required quantitation limit (CRQL) (except acetone in sample DSX44908M which was greater than the CRQL). Acetone in samples DSX44301D and DSX44302 were qualified with a "U" code according to the blank rules.

B. Two method blanks were analyzed for base/neutrals and acids with phenol and bis(2-ethylhexyl)phthalate reported levels greater than the instrument detection limit (IDL) but less than the contract required quantitation limit (CRQL). Since all associated data were non-detect, no data were qualified by the blank rules.

C. Two field blanks, DSX44207F and DSX44209F and two rinsate blanks, DSX44205 and DSX44208 were analyzed for volatiles with methylene chloride, chloroform, and toluene reported at levels greater than the instrument detection limit (IDL) but less than the contract required quantitation limit (CRQL). Methylene chloride in sample DSX44900P was qualified with a "U" code according to the blank rules.

D. One field blank, DSX44207F and two rinsate blanks, DSX44205 and DSX44208 were analyzed for base/neutrals and acids with bis(2-ethylhexyl)phthalate reported at levels greater than the instrument detection limit (IDL) but less than the contract required quantitation limit (CRQL). Since all associated data were non-detect, no data were qualified by the blank rules.

6. SURROGATE RECOVERY

A. All surrogates were within quality control limit requirements for percent recovery for the volatile fraction except toluene-d8 in samples DSX44206D and DSX44206MS. Upon reanalysis of the samples, the surrogates were within quality control limit requirements. Data was reported from the original sample due to the holding time criterion being exceeded and since all compounds were non-detect, no data were qualified by the surrogate recovery rules.

B. All base/neutral and acid surrogates were within quality control limit requirements for percent recovery.

7. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A. A matrix spike/matrix spike duplicate was analyzed for volatiles and was within quality control limit requirements for percent recovery and relative percent difference.

B. A matrix spike/matrix spike duplicate was analyzed for base/neutrals and acids with 4-nitrophenol outside quality control limit requirements for percent recovery in the matrix spike and matrix spike duplicate and 2,4-dinitrotoluene for percent recovery in the matrix spike duplicate. All spiking compounds were within quality control limits for relative percent difference. No data were qualified by the matrix spike/matrix spike duplicate rules.

8. PERFORMANCE EVALUATION SAMPLE

A. Performance evaluation sample, DSX44900P, was submitted to the laboratory for volatile analysis with all compounds contained in the audit identified except dichloromethane and 2-chloroethyl ethyl ether. O-dichlorobenzene was reported as an isomer. No data were qualified by the performance evaluation sample.

B. Performance evaluation sample, DSX44900P, was submitted to the laboratory for base/neutral and acid analysis with all compounds contained in the audit identified except 4-chlorobenzotrifluoride, m-chlorotoluene, 2,4-dichlorotoluene, 1,3,5-trichlorobenzene or 1,2,3,-trichlorobenzene, and 2,4,6-trichloroaniline. 1,3,5-trichlorobenzene or 1,2,3-trichlorobenzene was reported as an unknown trichlorobenzene and 1,2,4,5-tetrachlorobenzene and 1,2,3,4-tetrachlorobenzene as an unknown tetrachlorobenzenes. Di-n-butylphthalate and bis(2-ethylhexyl)phthalate were also reported. No data were qualified by the performance evaluation sample.

9. **COMPOUND IDENTIFICATION and QUANTITATION**

A. All target compound identifications were supported by good agreement between sample and standard mass spectra submitted for each positive sample response.

B. In a level 2 review, no calculations from raw data (quantitation reports) are performed.

C. Several compounds in each fraction were "U" coded due to the concentration being greater than the instrument detection limit (IDL) but less than the contract required quantitation limit (CRQL).

10. **SUMMARY**

A. Benzene, ethylbenzene, and total xylenes in sample DSX44010 were qualified with a "J" code due to the holding times being exceeded.

B. Acetone in volatile sample DSX44908M was qualified with a "J" code due to the continuing calibration criterion for percent difference being exceeded.

C. 4-nitrophenol and bis(2-ethylhexyl)phthalate in base/neutral and acid sample DSX44900P and pyrene in sample DSX44010 were qualified with a "J" due to the continuing calibration criterion for percent difference being exceeded.

D. Acetone in samples DSX44301D and DSX44302 and methylene chloride in sample DSX44900P were qualified with a "U" code due to blank contamination.

E. This data package generally meets the requirements for precision, accuracy, and completeness as described in SOW for Organic Analysis dated March 1990, with the exceptions noted above.

ENVIRONMENTAL SERVICES ASSISTANCE TEAM – ZONE II

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TO: Larry Marchin/Barry Evans
Data Review Task Monitor

THRU: Harold Brown, Ph.D.
ESAT Deputy Project Officer, EPA

FROM: Kevin Ludwikoski
ESAT Data Reviewer

THRU: Ronald A. Ross
ESAT Team Manager

DATE: May 7, 1991
SUBJECT: Review of inorganic data for Laclede Coal Gas Co.

TID# 07-9103-535
ASSIGNMENT# 779
ICF ACCT# 302-26-535-02
ManTech S.O.# 1073-535
ESAT Document No. ESAT-VII-535-0026

These data were reviewed primarily according to the "Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses," July 1988 revision with changes given in the Region VII Inorganic Data Review Training Manual and EPA memorandums.

The following comments and attached data sheets are a result of the ESAT review, according to EPA policies, of the following data from the contract laboratory.

CASE NO.: 15978
SITE: Laclede Coal Gas Co.
REVIEWER: Kevin Ludwikoski

LABORATORY: SKINER
METHOD NO.: CS0390I
EPA ACTIVITY NO.: DSX44
MATRIX: WATER

TOTAL METALS and CN
(WATER)

SMO Sample No.	EPA Sample No.	SMO Sample No.	EPA Sample No.
MGG575	DSX44203	MGG582	DSX44206D
MGG577	DSX44204	MGG584	DSX44207F
MGG579	DSX44205F	MGG586	DSX44208F
MGG580	DSX44206	MGG588	DSX44303
(MGG581	DSX44206)*		

* See discussion

GENERAL

This data review assignment covers EIGHT WATER samples analyzed for TOTAL METALS and CYANIDE for case number 15978. There was one field blank (DSX44207F), two rinsates (DSX44205F and DSX44208F), and one field duplicate included with this assignment.

1. **Technical Holding Times / Preservation**

Technical holding times were observed for all analytes.

2. **Initial and Continuing Calibration**

All percent recoveries were within control limits.

3. **Blanks**

Several analytes were detected in the blanks. Corresponding sample results were qualified according to the blank rule using five times the highest blank value. Sample results requiring modification are reported as non-detect on the attached data sheets.

TOTAL METALS and CN^-
(WATER)

Analyte	5 x Highest Blank (µg/L)	Qualified Samples
Al	1550	None qualified
Ag	11	None qualified
Ca	250500	DSX44203, -204, -206, -206L, -206D, -208F, -303, -920C
Cr	78	DSX44206D, -303
Co	12	None qualified
Cu	985	DSX44203, -204, -206, -206L, -206D, -206S, -920C
Pb	158	DSX44205F, -207F, -303, -920C
Mg	96500	DSX44203, -204, -206, -206D, -206L, -303, -920C
Na	92300	DSX44204, -303, -920C
Ni	43	None qualified
K	19900	DSX44206, -206D, -206L, -303
Zn	316	DSX44205F, -207F, -303
As	10	None qualified
Ba	247	None qualified
Fe	24850	DSX44204, -205F, -920C
Mn	196	DSX44205F
CN^-	64	None qualified

4. ICP Interference Check

Recoveries of solution AB analytes were within control limits. K, Sb, Zn, and Na were found but not present in the ICS solution. All absolute values for these analytes were below the CRDL and IDL; therefore, no data were qualified by the ICP interference check sample.

5. Laboratory Control Standard (LCS)

LCS results were within established control limits.

6. Duplicates

The RPD for As exceeded control limits. The sample results that were coded J are listed below.

TOTAL METALS and CN^-
(WATER)

Analyte	Samples Qualified	Code
As	DSX44203, -206, -206D, -206S, -920C	J

7. Matrix Spike Sample

As, Cr, Se, Tl and CN^- were out of range for matrix spike recovery. The samples that had data qualified are listed below.

TOTAL METALS
(WATER)

Analyte	% Rec	Sample No.	Code
As	63.4	DSX44203, -206, -206D, -206L, -920C	J
Cr	74.3	DSX44208F -920C	J
Se	0.0	DSX44203, -204, -205, -206, -206D, -206L -207F, -208, -303	I
		DSX44920C	J
Tl	14.5	DSX44203, -204, -205, -206, -206D, -206L -207F, -208, -303	I
		DSX44920C	J
CN^-	66.9	DSX44203, -204, -205	J

Note: Samples DSX44206D and DSX44303 were above the CRDL, but had been previously "U" coded for Cr according to the blank rule.

Note: All samples that were "J" coded for As, with the exception of DSX44206L, had been "J" coded for As according to the duplicate rule.

8. **ICP Serial Dilution**

The ICP serial dilution results were within control limits for all analytes of interest.

9. **Furnace Atomic Absorption**

The analytical scheme was followed for Furnace AA analysis. MSA correlation coefficients were acceptable for As in sample DSX44206 (cc=.9970).

10. **Discussion**

Sample numbers MGG580 and MGG581 both had an EPA sample number DSX44206. Sample MGG581 had been filtered in the field for Dissolved Metals analysis but was included in the Total Metals package. Both aliquots were analyzed as different samples for Total Metals. Therefore, sample MGG580 was reported as DSX44206 and MGG581 was not reported.

11. **Summary**

Ten analytes had samples that were qualified by the blank rule, one by the duplicate rule, and five by the spike rule.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7
25 FUNSTON ROAD
KANSAS CITY, KANSAS 66115

DATE: 3/26/91

SUBJECT: Activity Number: DSX44
Site Description: Laclede Coal Gas

FROM: D. Simmons D Simmons
CLQA-LABO-ENSV

TO: LABO Primary File

Comments regarding the subject activity are as follows:

#301 TPHs sample was broken.

SAMP. NO = SAMPLE IDENTIFICATION NUMBER
QCC = QUALITY CONTROL SAMPLE/AUDIT CODE
M = MEDIA OF SAMPLE (A=AIR, T=TISSUE, H=HAZARDOUS MATERIAL, S=SEDIMENT/SOIL, W=WATER)
AIRS/STORET LOC. NO. = A SAMPLING SITE LOCATION IDENTIFICATION NUMBER
BEG. DATE = THE DATE SAMPLING WAS STARTED
BEG. TIME = THE TIME SAMPLING WAS STARTED
END. DATE = THE DATE SAMPLING WAS ENDED
END. TIME = THE TIME SAMPLING WAS STOPPED
A = RESERVED
B = RESERVED
PES = PESTICIDES BY CONTRACT
= DIOXINS/FURANS BY EPA
E = EXPLOSIVES BY CONTRACT
FLD = FIELD MEASUREMENTS BY EPA
G = MINERALS & DISSOLVED MATERIALS BY EPA
HER = HERBICIDES BY EPA
I = ION CHROMATOGRAPHY ANALYSES BY EPA
MC = METALS BY CONTRACT
BNC = BASE NEUTRALS BY CONTRACT
L = FISH PHYSICAL DATA BY EPA
MET = METALS BY EPA
N = FISH TISSUE PARAMETERS BY EPA
VC = VOLATILES BY CONTRACT
P = PESTICIDES BY EPA
Q = FLASH POINT ANALYSES BY EPA
R = RESERVED
BN = SEMIVOLATILE BY EPA
T = CYANIDE PHENOL BY EPA
U = RESERVED
VOA = VOLATILE ORGANICS BY EPA
HC = HERBICIDES BY CONTRACT
X = RESERVED
Y = RESERVED
TRK = ACTIVITY TRACKING PARAMETERS BY EPA

STORET DETECTION IDENTIFIERS
BLANK = NO REMARKS
J = DATA REPORTED BUT NOT VALID BY APPROVED QC PROCEDURES
I = INVALID SAMPLE/DATA - VALUE NOT REPORTED
U = LESS THAN (MEASUREMENT DETECTION LIMIT)
M = DETECTED BUT BELOW THE LEVEL FOR ACCURATE QUANTIFICATION
D = PARAMETER NOT ANALYZED

CONTRACTOR/ IN HOUSE / FIELD MEDIA GROUPS
FIELD * * * = AF,HF,SF,TF,WF,ZZ
CONTRACTOR * * = HA,HC,HJ,HK,HO,SC,SJ,SK,SO,SW,TC,TJ, TK,TO,TW,WA,WC,WE,WJ,WK,WO,WW
IN HOUSE * = ALL OTHERS

QUALITY CONTROL AUDIT CODES
A = TRUE VALUE FOR CALIBRATION STANDARD
B = CONCENTRATION RESULTING FROM DUPLICATE LAB SPIKE
C = MEASURED VALUE FOR CALIBRATION STANDARD
D = MEASURED VALUE FOR FIELD DUPLICATE
F = MEASURED VALUE FOR FIELD BLANK
G = MEASURED VALUE FOR METHOD STANDARD
H = TRUE VALUE FOR METHOD STANDARD
K = CONCENTRATION RESULTING FROM DUPLICATE FIELD SPIKE
L = MEASURED VALUE FOR LAB DUPLICATE
M = MEASURED VALUE FOR LAB BLANK
N = MEASURED VALUE FOR DUPLICATE FIELD SPIKE
P = MEASURED VALUE FOR PERFORMANCE STANDARD
R = CONCENTRATION RESULTING FROM LAB SPIKE
S = MEASURED VALUE FOR LAB SPIKE
T = TRUE VALUE OF PERFORMANCE STANDARD
W = MEASURED VALUE FOR DUPLICATE LAB SPIKE
Y = MEASURED VALUE FOR FIELD SPIKE
Z = CONCENTRATION RESULTING FROM FIELD SPIKE

MEDIA CODES
A = AIR
T = BIOLOGICAL (PLANT & ANIMAL) TISSUE
H = HAZARDOUS MATERIALS/MAN MADE PRODUCTS
S = SEDIMENT, SLUDGE & SOIL
W = WATER

UNITS
NA = NOT APPLICABLE
PG = PICOGRAMS (1 X 10-12 GRAMS)
NG = NANOGRAMS (1 X 10-9 GRAMS)
UG = MICROGRAMS (1 X 10-6 GRAMS)
MG = MILLIGRAMS (1 X 10-3 GRAMS)
M3 = METER CUBED
MPH = MILES PER HOUR
SCM = STANDARD (1 ATM, 25 C) CUBIC METER
KG = KILOGRAM
L = LITER
C = CENTIGRADE DEGREES
SU = STANDARD (PH) UNITS
# = NUMBER
LB = POUNDS
IN = INCHES
M/F = MALE/FEMALE
M2 = SQUARE METER
I.D. = SPECIES IDENTIFICATION
GPM = GALLONS PER MINUTE
CFS = CUBIC FEET PER SECOND
MGD = MILLION GALLONS PER DAY
1000G= FLOW, 1000 GALLONS PER COMPOSITE
UMHOS= CONDUCTIVITY UNITS (1/OHMS)
NTU = TURBIDITY UNITS
PC/L = PICO (1 X 10-12) CURRIES PER LITER
MV = MILLIVOLT
SQ FT= SQUARE FEET
P/CM2= PICOGRAMS PER SQ. CENTIMETER
U/CM2= MICROGRAMS PER SQ. CENTIMETER

ANALYSIS REQUEST REPORT

VALIDATED DATA

FOR ACTIVITY: DSX44

S P F D

06/12/91 16:34:32

• FINAL REPORT

FY: 91 ACTIVITY: DSX44 DESCRIPTION: LACLEDE COAL GAS LOCATION: MISSOURI

STATUS: ACTIVE TYPE: SAMPLING - CONTRACT LAB ANALYSIS PROJECT: A34

LABO DUE DATE IS 5/14/91. REPORT DUE DATE IS 5/28/91.

INSPECTION DATE: 3/14/91 ALL SAMPLES RECEIVED DATE: 03/15/91

ALL DATA APPROVED BY LABO DATE: 06/12/91 FINAL REPORT TRANSMITTED DATE: 06/21/91

EXPECTED LABO TURNAROUND TIME IS 60 DAYS EXPECTED REPORT TURNAROUND TIME IS 75 DAYS

ACTUAL LABO TURNAROUND TIME IS 89 DAYS ACTUAL REPORT TURNAROUND TIME IS 99 DAYS

SAMP. NO.	QCC	M	DESCRIPTION	SAMPLE STATUS	# CONT.	CITY	STATE	AIRS/ STORET LOC NO	BEG. DATE	BEG. TIME	END. DATE	END. TIME
001		S	BACKGROUND SAMPLE-CSI-A	1	4	ST. LOUIS	MISSOURI		03/07/91	15:36	/ /	:
002		S	BACKGROUND SAMPLE-CSI-B	1	4	ST. LOUIS	MISSOURI		03/07/91	11:00	/ /	:
003		S	BACKGROUND SAMPLE-CSI-C	1	4	ST. LOUIS	MISSOURI		03/07/91	16:45	/ /	:
004		S	BACKGROUND SAMPLE-CSI-D	1	4	ST. LOUIS	MISSOURI		03/07/91	16:55	/ /	:
005		S	BACKGROUND SAMPLE-CSI-E	1	4	ST. LOUIS	MISSOURI		03/07/91	17:15	/ /	:
006		S	BORING LOCAL.#6-B-06-CS2	1	4	ST. LOUIS	MISSOURI		03/08/91	09:20	/ /	:
007		S	BORING LOCAL.#6-R-06-CS2	1	4	ST. LOUIS	MISSOURI		03/08/91	09:35	/ /	:
008		S	R-06-CS3 SAMPLE LOCATION	1	4	ST. LOUIS	MISSOURI		03/08/91	11:07	/ /	:
009		S	B-14-CS4 SAMPLE LOCATION	1	4	ST. LOUIS	MISSOURI		03/08/91	13:50	/ /	:
010		W	B14-CS4 SAMPLE LOCATION	1	4	ST. LOUIS	MISSOURI		03/08/91	14:20	/ /	:
011		S	B-07-CS6 SAMPLE LOCATION	1	4	ST. LOUIS	MISSOURI		03/08/91	17:35	/ /	:
012		S	R13-CS7 SAMPLE LOCATION	1	4	ST. LOUIS	MISSOURI		03/09/91	09:24	/ /	:
013		S	B13-CS7 SAMPLE LOCATION	1	4	ST. LOUIS	MISSOURI		03/09/91	09:45	/ /	:
101		S	BORING LOCATION-01/MOUND STR POWER	1	3	ST. LOUIS	MISSOURI		03/04/91	13:05	/ /	:
102		S	BORING LOCATION 02	1	3	ST. LOUIS	MISSOURI		03/02/91	14:20	/ /	:
103		S	SURFACE SOIL AT EAST CENTRAL OF TANK	1	3	ST. LOUIS	MISSOURI		03/04/91	15:30	/ /	:
104		S	BORING LOCATION 05	1	3	ST. LOUIS	MISSOURI		03/04/91	17:25	/ /	:
105		S	BETWEEN TANKS 7-8/BORING 07	1	3	ST. LOUIS	MISSOURI		03/05/91	13:50	/ /	:
106		S	BORING LOCATION-15	1	3	ST. LOUIS	MISSOURI		03/06/91	14:10	/ /	:
107		S	BORING LOCATION -16	1	3	ST. LOUIS	MISSOURI		03/06/91	15:15	/ /	:
108		S	BORING LOCATION-17	1	3	ST. LOUIS	MISSOURI		03/06/91	15:45	/ /	:
109		S	BORING LOCATION-18	1	3	ST. LOUIS	MISSOURI		03/06/91	16:53	/ /	:
110		S	R19-SAMPLE LOCATION	1	3	ST. LOUIS	MISSOURI		03/14/91	07:45	/ /	:
111		S	R20-SAMPLE LOCATION	1	3	ST. LOUIS	MISSOURI		03/14/91	07:30	/ /	:
112		S	B21-SAMPLE LOCATION	1	3	ST. LOUIS	MISSOURI		03/13/91	17:30	/ /	:

VALIDATED DATA

SAMP. NO.	QCC	M	DESCRIPTION	SAMPLE STATUS	# CONT.	CITY	STATE	AIRS/ STORET LOC NO	BEG. DATE	BEG. TIME	END. DATE	END. TIME
201		W	SAMPLE LOCATION-MULLANPHY STR./RR TRAC	1	8	ST. LOUIS	MISSOURI		03/05/91	17:15	/ /	:
202		W	SAMPLE LOCATION-TERMINAL RR ASSOC. ETC	1	8	ST. LOUIS	MISSOURI		03/06/91	10:00	/ /	:
203		W	ENGINEERING TEST WELL(147 FT. NORTH)	1	7	ST. LOUIS	MISSOURI		03/07/91	14:30	/ /	:
204		W	ENGINEERING TEST WELL-363FT.NORTH	1	7	ST. LOUIS	MISSOURI		03/07/91	16:45	/ /	:
205	F	W	EQUIPMENT RINSATE BLANK	1	4	ST. LOUIS	MISSOURI		03/09/91	08:30	/ /	:
206		W	ENGINEERING TEST WELL-20FT. WEST	1	7	ST. LOUIS	MISSOURI		03/09/91	10:27	/ /	:
206	D	W	ENGINEERING TEST WELL-20FT. WEST	1	7	ST. LOUIS	MISSOURI		03/09/91	10:27	/ /	:
207	F	W	LACLEDE COAL GAS FIELD BLANK	1	6	ST. LOUIS	MISSOURI		03/09/91	12:18	/ /	:
208	F	W	GEOPROBE PIPE RINSATE BLANK SAMPLE	1	5	ST. LOUIS	MISSOURI		03/08/91	11:00	/ /	:
209	F	W	LACLEDE COAL GAS TRIP BLANK	1	1	ST. LOUIS	MISSOURI		03/09/91	12:30	/ /	:
301		W	SAMPLE LOCATION-ABANDONED PUMP HOUSE	1	9	ST. LOUIS	MISSOURI		03/06/91	14:45	/ /	:
301	D	W	DUP. SAMPLE-LOC/ABANDONED PUMP HOUSE	1	9	ST. LOUIS	MISSOURI		03/06/91	14:45	/ /	:
302		W	SAMPLE LOCATION-UPSTREAM OF NE CORN.	1	9	ST. LOUIS	MISSOURI		03/06/91	17:15	/ /	:
303		W	SW SAMPLE/MISS. RIVER	1	8	ST. LOUIS	MISSOURI		03/07/91	14:00	/ /	:
304		W	SAMPLE LOCATION-ILL.AMERICAN DRNK.WATR	1	9	ST. LOUIS	MISSOURI		03/07/91	08:55	/ /	:
304	D	W	DUP. SAMPLE-LOC/ILL. AMERICAN DRNK.H2O	1	9	ST. LOUIS	MISSOURI		03/07/91	08:55	/ /	:
401		S	SEDIMENT SAMPLE/GRAB SAMPLE	1	5	ST. LOUIS	MISSOURI		03/06/91	15:30	/ /	:
401	D	S	SEDIMENT SAMPLE/GRAB SAMPLE	1	5	ST. LOUIS	MISSOURI		03/06/91	15:30	/ /	:
402		S	SEDIMENT SAMPLE/GRAB-SW SAMPLE#302	1	5	ST. LOUIS	MISSOURI		03/06/91	17:35	/ /	:
403		S	SEDIMENT SAMPLE/GRAB/MISS RIVER	1	5	ST. LOUIS	MISSOURI		03/07/91	14:15	/ /	:
501		S	LACLEDE COAL GAS-OIL SAMPLE	0	0	ST. LOUIS	MISSOURI		03/09/91	09:15	/ /	:

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND		UNITS	001		002		003		004		005	
SM01 SILVER	BY ICAP	MG/KG	2.4	U	2.3	U	2.6	U	2.6	U	2.9	U
SM02 ALUMINUM	BY ICAP	MG/KG	7500		8600		13000		15000		14000	
SM03 ARSENIC	BY ICAP	MG/KG	7.7		5.7		8.1		10		6.7	
SM04 BARIUM	BY ICAP	MG/KG	130		120		170		120		230	
SM05 BERYLLIUM	BY ICAP	MG/KG	1.2	U	1.2	U	1.3	U	1.3	U	1.5	U
SM06 CADMIUM	BY ICAP	MG/KG	1.2	U	1.2	U	1.3	U	1.3	U	1.5	U
SM07 COBALT	BY ICAP	MG/KG	12	U	12	U	13	U	13	U	15	U
SM08 CHROMIUM	BY ICAP	MG/KG	11		9.9		14		14		15	
SM09 COPPER	BY ICAP	MG/KG	56		33		26		20		22	
SM10 IRON	BY ICAP	MG/KG	29000		76000		19000		21000		19000	
SM11 MANGANESE	BY ICAP	MG/KG	320	J	430	J	1700	J	660	J	920	J
SM12 MOLYBDENUM	BY ICAP	MG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SM13 NICKEL	BY ICAP	MG/KG	17		14		20		18		22	
SM14 LEAD	BY ICAP	MG/KG	250	J	78	J	52	J	19	J	26	J
SM15 ANTIMONY	BY ICAP	MG/KG	14	U	14	U	16	U	16	U	18	U
SM16 SELENIUM	BY ICAP	MG/KG	3.0		2.6	J	1.3	U	1.3	U	1.5	U
SM17 TITANIUM	BY ICAP	MG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SM18 THALLIUM	BY ICAP	MG/KG	2.4	U	2.3	U	2.6	U	2.6	U	2.9	U
SM19 VANADIUM	BY ICAP	MG/KG	25		23		33		32		33	
SM20 ZINC	BY ICAP	MG/KG	120		85		65		53		64	
SM21 CALCIUM	BY ICAP	MG/KG	59000		47000		16000		3200		15000	
SM22 MAGNESIUM	BY ICAP	MG/KG	2300		2500		2900		2900		1900	
SM23 SODIUM	BY ICAP	MG/KG	1200	U	1200	U	1300	U	1300	U	1500	U
SM24 POTASSIUM	BY ICAP	MG/KG	1200	U	1200	U	1300	U	1400		2100	
SS01 PHENOL		UG/KG	370	U	400	U	440	U	430	U	630	U
SS02 CARBAZOLE		UG/KG	370	U	400	U	440	U	430	U	630	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	001		002		003		004		005	
SS03 BIS(2-CHLOROETHYL) ETHER	UG/KG	370	U	400	U	440	U	430	U	630	U
SS04 2-CHLOROPHENOL	UG/KG	370	U	400	U	440	U	430	U	630	U
SS05 1,3-DICHLOROBENZENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS06 1,4-DICHLOROBENZENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS07 BENZYL ALCOHOL	UG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SS08 1,2-DICHLOROBENZENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS09 2-METHYLPHENOL (O-CRESOL)	UG/KG	370	U	400	U	440	U	430	U	630	U
SS10 BIS(2-CHLOROISOPROPYL) ETHER	UG/KG	370	U	400	U	440	U	430	U	630	U
SS11 4-METHYLPHENOL (P-CRESOL)	UG/KG	370	U	400	U	440	U	430	U	630	U
SS12 N-NITROSO-DIPROPYLAMINE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS13 HEXACHLOROETHANE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS14 NITROBENZENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS15 ISOPHORONE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS16 2-NITROPHENOL	UG/KG	370	U	400	U	440	U	430	U	630	U
SS17 2,4-DIMETHYLPHENOL	UG/KG	370	U	400	U	440	U	430	U	630	U
SS18 BENZOIC ACID	UG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SS19 BIS(2-CHLOROETHYOXY) METHANE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS20 2,4-DICHLOROPHENOL	UG/KG	370	U	400	U	440	U	430	U	630	U
SS21 1,2,4-TRICHLOROBENZENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS22 NAPHTHALENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS23 4-CHLOROANILINE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS24 HEXACHLOROBUTADIENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS25 4-CHLORO-3-METHYLPHENOL	UG/KG	370	U	400	U	440	U	430	U	630	U
SS26 2-METHYLNAPHTHALENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS27 HEXACHLOROCYCLOPENTADIENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS28 2,4,6-TRICHLOROPHENOL	UG/KG	370	U	400	U	440	U	430	U	630	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	001		002		003		004		005	
SS29 2,4,5-TRICHLOROPHENOL	UG/KG	900	U	970	U	1100	U	1000	U	1500	U
SS30 2-CHLORONAPHTHALENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS31 2-NITROANILINE	UG/KG	900	U	970	U	1100	U	1000	U	1500	U
SS32 DIMETHYLPHTHALATE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS33 ACENAPHTHYLENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS34 3-NITROANILINE	UG/KG	900	U	970	U	1100	U	1000	U	1500	U
SS35 ACENAPHTHENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS36 2,4-DINITROPHENOL	UG/KG	900	U	970	U	1100	U	1000	U	1500	U
SS37 4-NITROPHENOL	UG/KG	900	U	970	U	1100	U	1000	U	1500	U
SS38 DIBENZOFURAN	UG/KG	370	U	400	U	440	U	430	U	630	U
SS39 2,4-DINITROTOLUENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS40 2,6-DINITROTOLUENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS41 DIETHYLPHTHALATE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS42 4-CHLOROPHENYL PHENYL ETHER	UG/KG	370	U	400	U	440	U	430	U	630	U
SS43 FLUORENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS44 4-NITROANILINE	UG/KG	900	U	970	U	1100	U	1000	U	1500	U
SS45 4,6-DINITRO-2-METHYLPHENOL	UG/KG	900	U	970	U	1100	U	1000	U	1500	U
SS46 N-NITROSODIPHENYLAMINE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS47 4-BROMOPHENYL PHENYL ETHER	UG/KG	370	U	400	U	440	U	430	U	630	U
SS48 HEXACHLOROBENZENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS49 PENTACHLOROPHENOL	UG/KG	900	U	970	U	1100	U	1000	U	1500	U
SS50 PHENANTHRENE	UG/KG	1400		400	U	440	U	430	U	630	U
SS51 ANTHRACENE	UG/KG	380		400	U	440	U	430	U	630	U
SS52 DI-N BUTYL PHTHALATE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS53 FLUORANTHENE	UG/KG	2000		520		540		430	U	630	U
SS54 PYRENE	UG/KG	2800		530		800		430	U	630	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	001		002		003		004		005	
SS55 BUTYL BENZYL PHTHALATE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS56 3,3'-DICHLOROBENZIDINE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS57 BENZO(A)ANTHRACENE	UG/KG	800		400	U	440	U	430	U	630	U
SS58 BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	960	J	1300	J	1200	J	1600	J	2500	J
SS59 CHRYSENE	UG/KG	800		400	U	440		430	U	630	U
SS60 DI-N-OCTYL PHTHALATE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS61 BENZO(B)FLUORANTHENE	UG/KG	1600		400	U	440	U	430	U	630	U
SS62 BENZO(K)FLUORANTHENE	UG/KG	400		400	U	440	U	430	U	630	U
SS63 BENZO(A)PYRENE	UG/KG	500		400	U	440	U	430	U	630	U
SS64 INDENO(1,2,3-CD)PYRENE	UG/KG	930		400	U	440	U	430	U	630	U
SS65 DIBENZO(A,H)ANTHRACENE	UG/KG	370	U	400	U	440	U	430	U	630	U
SS66 BENZO(G,H,I)PERYLENE	UG/KG	200		400	U	440	U	430	U	630	U
ST09 CYANIDE	MG/KG	6		24		6.5	U	6.6	U	7.4	U
SV03 CHLOROMETHANE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV04 BROMOMETHANE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV05 VINYL CHLORIDE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV06 CHLOROETHANE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV07 METHYLENE CHLORIDE	UG/KG	20	U	27	U	13	U	13	U	14	U
SV08 1,1-DICHLOROETHYLENE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV09 1,1-DICHLOROETHANE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV10 TRANS-1,2-DICHLOROETHYLENE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV11 CHLOROFORM	UG/KG	12	U	12	U	13	U	13	U	14	U
SV12 1,2 DICHLOROETHANE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV13 1,1,1-TRICHLOROETHANE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV14 CARBON TETRACHLORIDE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV15 BROMODICHLOROMETHANE	UG/KG	12	U	12	U	13	U	13	U	14	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	001		002		003		004		005	
SV16 1.2-DICHLOROPROPANE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV17 BENZENE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV18 TRANS-1.3-DICHLOROPROPENE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV19 TRICHLOROETHYLENE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV20 CIS-1.3-DICHLOROPROPENE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV21 DIBROMOCHLOROMETHANE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV22 1.1.2-TRICHLOROETHANE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV24 BROMOFORM	UG/KG	12	U	12	U	13	U	13	U	14	U
SV25 1.1.2.2-TETRACHLOROETHENE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV26 TOLUENE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV27 1.1.2.2-TETRACHLOROETHANE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV28 CHLOROBENZENE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV29 ETHYL BENZENE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV30 ACETONE	UG/KG	16	U	63	U	40	U	33	U	53	J
SV31 CARBON DISULFIDE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV32 2-BUTANONE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV33 VINYL ACETATE	UG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SV34 2-HEXANONE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV35 4-METHYL-2-PENTANONE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV36 STYRENE	UG/KG	12	U	12	U	13	U	13	U	14	U
SV37 XYLENES, TOTAL	UG/KG	12	U	12	U	13	U	13	U	14	U
Z701 SAMPLE NUMBER	NA	001		002		003		004		005	
Z702 ACTIVITY CODE	NA	DSX44		DSX44		DSX44		DSX44		DSX44	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND		UNITS	3-8' 006		8-13 007		5-12 008		4-8' 009		010	
SM01 SILVER	BY ICAP	MG/KG	2.2	U	2.6	U	2.6	U	2.8	U		
SM02 ALUMINUM	BY ICAP	MG/KG	2500		8600		9300		4500			
SM03 ARSENIC	BY ICAP	MG/KG	4.3		8.5		18		8.5			
SM04 BARIUM	BY ICAP	MG/KG	92		260		160		250			
SM05 BERYLLIUM	BY ICAP	MG/KG	1.1	U	1.3	U	1.3	U	1.4	U		
SM06 CADMIUM	BY ICAP	MG/KG	1.1	U	1.3	U	1.3	U	1.4	U		
SM07 COBALT	BY ICAP	MG/KG	11	U	13	U	13	U	14	U		
SM08 CHROMIUM	BY ICAP	MG/KG	9.5		12		13		14			
SM09 COPPER	BY ICAP	MG/KG	32		20		27		21			
SM10 IRON	BY ICAP	MG/KG	7200		17000		41000		16000			
SM11 MANGANESE	BY ICAP	MG/KG	170		720		430		180			
SM12 MOLYBDENUM	BY ICAP	MG/KG	NA	O	NA	O	NA	O	NA	O		
SM13 NICKEL	BY ICAP	MG/KG	9.0	U	20		16		11	U		
SM14 LEAD	BY ICAP	MG/KG	78	J	55	J	57	J	580	J		
SM15 ANTIMONY	BY ICAP	MG/KG	13	U	16	U	16	U	17	U		
SM16 SELENIUM	BY ICAP	MG/KG	2.1		1.3	U	1.3	U	1.4	U		
SM17 TITANIUM	BY ICAP	MG/KG	NA	O	NA	O	NA	O	NA	O		
SM18 THALLIUM	BY ICAP	MG/KG	2.2	U	2.6	U	2.6	U	2.8	U		
SM19 VANADIUM	BY ICAP	MG/KG	11	U	22		29		18			
SM20 ZINC	BY ICAP	MG/KG	110	J	53	J	71	J	200	J		
SM21 CALCIUM	BY ICAP	MG/KG	35000		5200		3100		25000			
SM22 MAGNESIUM	BY ICAP	MG/KG	3100		3000		2400		1800			
SM23 SODIUM	BY ICAP	MG/KG	1100	U	1300	U	1300	U	1400	U		
SM24 POTASSIUM	BY ICAP	MG/KG	1100	U	1300	U	1300	U	1400	U		
SS01 PHENOL		UG/KG	11000	U	12000	U	13000	U	12000	U		
SS02 CARBAZOLE		UG/KG	11000	U								

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	006		007		008		009		010
SS29 2,4,5-TRICHLOROPHENOL	UG/KG	58000	U	59000	U	69000	U	59000	U	
SS30 2-CHLORONAPHTHALENE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS31 2-NITROANILINE	UG/KG	58000	U	59000	U	69000	U	59000	U	
SS32 DIMETHYLPHTHALATE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS33 ACENAPHTHYLENE	UG/KG	11000	U	12000	U	15000		12000	U	
SS34 3-NITROANILINE	UG/KG	58000	U	59000	U	69000	U	59000	U	
SS35 ACENAPHTHENE	UG/KG	11000	U	12000	U	32000		12000		
SS36 2,4-DINITROPHENOL	UG/KG	58000	U	59000	U	69000	U	59000	U	
SS37 4-NITROPHENOL	UG/KG	58000	U	59000	U	69000	U	59000	U	
SS38 DIBENZOFURAN	UG/KG	11000	U	12000	U	25000		12000	U	
SS39 2,4-DINITROTOLUENE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS40 2,6-DINITROTOLUENE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS41 DIETHYLPHTHALATE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS42 4-CHLOROPHENYL PHENYL ETHER	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS43 FLUORENE	UG/KG	20000		12000	U	[redacted]		3000		
SS44 4-NITROANILINE	UG/KG	58000	U	59000	U	69000	U	59000	U	
SS45 4,6-DINITRO-2-METHYLPHENOL	UG/KG	58000	U	59000	U	69000	U	59000	U	
SS46 N-NITROSODIPHENYLAMINE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS47 4-BROMOPHENYL PHENYL ETHER	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS48 HEXACHLOROBENZENE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS49 PENTACHLOROPHENOL	UG/KG	58000	U	59000	U	69000	U	59000	U	
SS50 PHENANTHRENE	UG/KG	63000		20000		[redacted]		6000		
SS51 ANTHRACENE	UG/KG	11000	U	12000	U	[redacted]		12000	U	
SS52 DI-N BUTYL PHTHALATE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS53 FLUORANTHENE	UG/KG	11000	U	12000	U	[redacted]		12000	U	
SS54 PYRENE	UG/KG	18000		[redacted]						

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	006		007		008		009		010
SS03 BIS(2-CHLOROETHYL) ETHER	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS04 2-CHLOROPHENOL	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS05 1.3-DICHLOROBENZENE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS06 1.4-DICHLOROBENZENE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS07 BENZYL ALCOHOL	UG/KG	NA	O	NA	O	NA	O	NA	O	
SS08 1.2-DICHLOROBENZENE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS09 2-METHYLPHENOL (O-CRESOL)	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS10 BIS(2-CHLOROISOPROPYL) ETHER	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS11 4-METHYLPHENOL (P-CRESOL)	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS12 N-NITROSO-DIPROPYLAMINE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS13 HEXACHLOROETHANE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS14 NITROBENZENE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS15 ISOPHORONE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS16 2-NITROPHENOL	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS17 2.4-DIMETHYLPHENOL	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS18 BENZOIC ACID	UG/KG	NA	O	NA	O	NA	O	NA	O	
SS19 BIS(2-CHLOROETHYOXY) METHANE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS20 2.4-DICHLOROPHENOL	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS21 1.2.4-TRICHLOROBENZENE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS22 NAPHTHALENE	UG/KG	23000		87000		2200000		68000		
SS23 4-CHLOROANILINE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS24 HEXACHLOROBUTADIENE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS25 4-CHLORO-3-METHYLPHENOL	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS26 2-METHYLNAPHTHALENE	UG/KG	30000		43000		69000		84000		
SS27 HEXACHLOROCYCLOPENTADIENE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS28 2.4.6-TRICHLOROPHENOL	UG/KG	11000	U	12000	U	13000	U	12000	U	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	006		007		008		009		010
SS55 BUTYL BENZYL PHTHALATE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS56 3,3'-DICHLOROBENZIDINE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS57 BENZO(A)ANTHRACENE	UG/KG	18000		12000	U	[redacted]		12000	U	
SS58 BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS59 CHRYSENE	UG/KG	[redacted]		12000	U	[redacted]		16000		
SS60 DI-N-OCTYL PHTHALATE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS61 BENZO(B)FLUORANTHENE	UG/KG	11000	U	12000	U	61000		12000	U	
SS62 BENZO(K)FLUORANTHENE	UG/KG	11000	U	12000	U	52000		12000	U	
SS63 BENZO(A)PYRENE	UG/KG	11000	U	12000	U	95000		12000	U	
SS64 INDENO(1,2,3-CD)PYRENE	UG/KG	11000	U	12000	U	37000		12000	U	
SS65 DIBENZO(A,H)ANTHRACENE	UG/KG	11000	U	12000	U	13000	U	12000	U	
SS66 BENZO(G,H,I)PERYLENE	UG/KG	11000	U	12000	U	44000		12000	U	
ST09 CYANIDE	MG/KG	87		180		860		7.0	U	
SV03 CHLOROMETHANE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV04 BROMOMETHANE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV05 VINYL CHLORIDE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV06 CHLOROETHANE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV07 METHYLENE CHLORIDE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV08 1,1-DICHLOROETHYLENE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV09 1,1-DICHLOROETHANE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV10 TRANS-1,2-DICHLOROETHYLENE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV11 CHLOROFORM	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV12 1,2-DICHLOROETHANE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV13 1,1,1-TRICHLOROETHANE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV14 CARBON TETRACHLORIDE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV15 BROMODICHLOROMETHANE	UG/KG	1500	U	12000	U	16000	U	1500	U	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	006		007		008		009		010
SV16 1,2-DICHLOROPROPANE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV17 BENZENE	UG/KG	9500		140000		150000		19000		
SV18 TRANS-1,3-DICHLOROPROPENE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV19 TRICHLOROETHYLENE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV20 CIS-1,3-DICHLOROPROPENE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV21 DIBROMOCHLOROMETHANE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV22 1,1,2-TRICHLOROETHANE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV24 BROMOFORM	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV25 1,1,2,2-TETRACHLOROETHENE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV26 TOLUENE	UG/KG	1700		26000		58000		1500	U	
SV27 1,1,2,2-TETRACHLOROETHANE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV28 CHLOROBENZENE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV29 ETHYL BENZENE	UG/KG	24000		46000		96000		5500		
SV30 ACETONE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV31 CARBON DISULFIDE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV32 2-BUTANONE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV33 VINYL ACETATE	UG/KG	NA	O	NA	O	NA	O	NA	O	
SV34 2-HEXANONE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV35 4-METHYL-2-PENTANONE	UG/KG	1500	U	12000	U	16000	U	1500	U	
SV36 STYRENE	UG/KG	1500	U	42000		16000	U	1500	U	
SV37 XYLENES, TOTAL	UG/KG	28000		230000		[redacted]		9400		
WM01 SILVER BY ICAP	UG/L									ATTACHMENT
WM02 ALUMINUM BY ICAP	UG/L									ATTACHMENT
WM03 ARSENIC BY ICAP	UG/L									ATTACHMENT
WM04 BARIUM BY ICAP	UG/L									ATTACHMENT
WM05 BERYLLIUM BY ICAP	UG/L									ATTACHMENT

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	006	007	008	009	010
WM06 CADMIUM BY ICAP	UG/L					ATTACHMENT
WM07 COBALT BY ICAP	UG/L					ATTACHMENT
WM08 CHROMIUM BY ICAP	UG/L					ATTACHMENT
WM09 COPPER BY ICAP	UG/L					ATTACHMENT
WM10 IRON BY ICAP	UG/L					ATTACHMENT
WM11 MANGANESE BY ICAP	UG/L					ATTACHMENT
WM12 MOLYBDENUM BY ICAP	UG/L					ATTACHMENT
WM13 NICKEL BY ICAP	UG/L					ATTACHMENT
WM14 LEAD BY ICAP	UG/L					ATTACHMENT
WM15 ANTIMONY BY ICAP	UG/L					ATTACHMENT
WM16 SELENIUM BY ICAP	UG/L					ATTACHMENT
WM17 TITANIUM BY ICAP	UG/L					ATTACHMENT
WM18 THALLIUM BY ICAP	UG/L					ATTACHMENT
WM19 VANADIUM BY ICAP	UG/L					ATTACHMENT
WM20 ZINC BY ICAP	UG/L					ATTACHMENT
WM21 CALCIUM, TOTAL BY ICAP	MG/L					ATTACHMENT
WM22 MAGNESIUM, TOTAL BY ICAP	MG/L					ATTACHMENT
WM23 SODIUM, TOTAL BY ICAP	MG/L					ATTACHMENT
WM24 POTASSIUM, TOTAL BY ICAP	MG/L					ATTACHMENT
WS01 PHENOL	UG/L					150 U
WS03 BIS(2-CHLOROETHYL) ETHER	UG/L					150 U
WS04 2-CHLOROPHENOL	UG/L					150 U
WS05 1,3-DICHLOROBENZENE	UG/L					150 U
WS06 1,4 DICHLOROBENZENE	UG/L					150 U
WS07 BENZYL ALCOHOL	UG/L					150 U
WS08 1,2-DICHLOROBENZENE	UG/L					150 U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	006	007	008	009	010	
WS09 2-METHYLPHENOL (O-CRESOL)	UG/L					150	U
WS10 BIS(2-CHLOROISOPROPYL) ETHER	UG/L					150	U
WS11 4-METHYLPHENOL (P-CRESOL)	UG/L					150	U
WS12 N-NITROSO-DIPROPYLAMINE	UG/L					150	U
WS13 HEXACHLOROETHANE	UG/L					150	U
WS14 NITROBENZENE	UG/L					150	U
WS15 ISOPHORONE	UG/L					150	U
WS16 2-NITROPHENOL	UG/L					150	U
WS17 2,4-DIMETHYLPHENOL	UG/L					150	U
WS18 BENZOIC ACID	UG/L					150	U
WS19 BIS(2-CHLOROETHYOXY) METHANE	UG/L					150	U
WS20 2,4-DICHLOROPHENOL	UG/L					150	U
WS21 1,2,4-TRICHLOROBENZENE	UG/L					150	U
WS22 NAPHTHALENE	UG/L					890	
WS23 4-CHLOROANILINE	UG/L					150	U
WS24 HEXACHLOROBUTADIENE	UG/L					150	U
WS25 4-CHLORO-3-METHYLPHENOL	UG/L					150	U
WS26 2-METHYLNAPHTHALENE	UG/L					980	
WS27 HEXACHLOROCYCLOPENTADIENE	UG/L					150	U
WS28 2,4,6-TRICHLOROPHENOL	UG/L					150	U
WS29 2,4,5-TRICHLOROPHENOL	UG/L					150	U
WS30 2-CHLORONAPHTHALENE	UG/L					150	U
WS31 2-NITROANILINE (ORTHO-NITROANILINE)	UG/L					150	U
WS32 DIMETHYLPHTHALATE	UG/L					150	U
WS33 ACENAPHTHYLENE	UG/L					150	U
WS34 3-NITROANILINE	UG/L					150	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	006	007	008	009	010	
WS35 ACENAPHTHENE	UG/L					150	
WS36 2,4-DINITROPHENOL	UG/L					150	U
WS37 4-NITROPHENOL	UG/L					150	U
WS38 DIBENZOFURAN	UG/L					150	U
WS39 2,4-DINITROTOLUENE	UG/L					150	U
WS40 2,6-DINITROTOLUENE	UG/L					150	U
WS41 DIETHYLPHTHALATE	UG/L					150	U
WS42 4-CHLOROPHENYL PHENYL ETHER	UG/L					150	U
WS43 FLUORENE	UG/L					170	
WS44 4-NITROANILINE	UG/L					380	U
WS45 4,6-DINITRO-2-METHYLPHENOL	UG/L					380	U
WS46 N-NITROSODIPHENYLAMINE	UG/L					150	U
WS47 4-BROMOPHENYL PHENYL ETHER	UG/L					150	U
WS48 HEXACHLOROBENZENE	UG/L					150	U
WS49 PENTACHLOROPHENOL	UG/L					380	U
WS50 PHENANTHRENE	UG/L					610	
WS51 ANTHRACENE	UG/L					150	U
WS52 DI-N-BUTYL PHTHALATE	UG/L					150	U
WS53 FLUORANTHENE	UG/L					150	U
WS54 PYRENE	UG/L					[redacted]	
WS55 BUTYL BENZYL PHTHALATE	UG/L					150	U
WS56 3,3'-DICHLOROBENZIDINE	UG/L					150	U
WS57 BENZO(A)ANTHRACENE	UG/L					150	U
WS58 BIS(2-ETHYLHEXYL)PHTHALATE	UG/L					150	U
WS59 CHRYSENE	UG/L					180	
WS60 DI-N-OCTYL PHTHALATE	UG/L					150	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	006	007	008	009	010	
WS61 BENZO(B)FLUORANTHENE	UG/L					150	U
WS62 BENZO(K)FLUORANTHENE	UG/L					150	U
WS63 BENZO(A)PYRENE	UG/L					150	U
WS64 INDENO(1,2,3-CD)PYRENE	UG/L					150	U
WS65 DIBENZO(A,H)ANTHRACENE	UG/L					150	U
WS66 BENZO(G,H,I)PERYLENE	UG/L					150	U
WS67 CARBAZOLE	UG/L					150	U
WT09 CYANIDE, TOTAL	MG/L					ATTACHMENT	
WV03 CHLOROMETHANE	UG/L					200	U
WV04 BROMOMETHANE	UG/L					200	U
WV05 VINYL CHLORIDE	UG/L					200	U
WV06 CHLOROETHANE	UG/L					200	U
WV07 METHYLENE CHLORIDE	UG/L					200	U
WV08 1,1-DICHLOROETHENE	UG/L					200	U
WV09 1,1-DICHLOROETHANE	UG/L					200	U
WV10 1,2-DICHLOROETHENE, TOTAL	UG/L					200	U
WV11 CHLOROFORM	UG/L					200	U
WV12 1,2-DICHLOROETHANE	UG/L					200	U
WV13 1,1,1-TRICHLOROETHANE	UG/L					200	U
WV14 CARBON TETRACHLORIDE	UG/L					200	U
WV15 BROMODICHLOROMETHANE	UG/L					200	U
WV16 1,2 DICHLOROPROPANE	UG/L					200	U
WV17 BENZENE	UG/L					3100	J
WV19 TRICHLOROETHENE	UG/L					200	U
WV20 CIS 1,3-DICHLOROPROPENE	UG/L					200	U
WV21 DIBROMOCHLOROMETHANE	UG/L					200	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	006	007	008	009	010	
WV22 1,1,2-TRICHLOROETHANE	UG/L					200	U
WV24 BROMOFORM	UG/L					200	U
WV25 TETRACHLOROETHENE	UG/L					200	U
WV26 TOLUENE	UG/L					200	U
WV27 1,1,2,2-TETRACHLOROETHANE	UG/L					200	U
WV28 CHLOROBENZENE	UG/L					200	U
WV29 ETHYL BENZENE	UG/L					280	J
WV30 ACETONE	UG/L					200	U
WV31 CARBON DISULFIDE	UG/L					200	U
WV32 2-BUTANONE	UG/L					200	U
WV33 VINYL ACETATE	UG/L					200	U
WV34 2-HEXANONE	UG/L					200	U
WV35 4-METHYL-2-PENTANONE	UG/L					200	U
WV36 STYRENE	UG/L					200	U
WV37 XYLENES, TOTAL	UG/L					290	J
WV40 TRANS-1,3-DICHLOROPROPENE	UG/L					200	U
ZZ01 SAMPLE NUMBER	NA	006	007	008	009	010	
ZZ02 ACTIVITY CODE	NA	DSX44	DSX44	DSX44	DSX44	DSX44	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

	COMPOUND	UNITS	011		012		013		101		102	
SM01	SILVER BY ICAP	MG/KG	2.5	U	2.8	U	3.0	U	2.4	U	2.5	U
SM02	ALUMINUM BY ICAP	MG/KG	7100		4600		3400		8400		4400	
SM03	ARSENIC BY ICAP	MG/KG	7.6		12		10		21		12	
SM04	BARIUM BY ICAP	MG/KG	230		56		61	U	220		78	
SM05	BERYLLIUM BY ICAP	MG/KG	1.3	U	1.4	U	1.5	U	1.2	U	1.3	U
SM06	CADMIUM BY ICAP	MG/KG	1.3	U	1.4	U	1.5	U	1.2	U	1.3	U
SM07	COBALT BY ICAP	MG/KG	13	U	14	U	15	U	12	U	13	U
SM08	CHROMIUM BY ICAP	MG/KG	11		21		17		19		9.6	
SM09	COPPER BY ICAP	MG/KG	24		83		130		140		36	
SM10	IRON BY ICAP	MG/KG	30000		120000		19000		45000		23000	
SM11	MANGANESE BY ICAP	MG/KG	260		210		150		350		140	
SM12	MOLYBDENUM BY ICAP	MG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SM13	NICKEL BY ICAP	MG/KG	17		24		15		28		17	
SM14	LEAD BY ICAP	MG/KG	130	J	160	J	250	J	300	J	120	J
SM15	ANTIMONY BY ICAP	MG/KG	15	U	17	U	18	U	15	U	15	U
SM16	SELENIUM BY ICAP	MG/KG	1.6		1.4	U	1.5	U	2.4		3.2	
SM17	TITANIUM BY ICAP	MG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SM18	THALLIUM BY ICAP	MG/KG	2.5	U	2.8	U	3.0	U	2.4	U	2.5	U
SM19	VANADIUM BY ICAP	MG/KG	19		24		18		29		18	
SM20	ZINC BY ICAP	MG/KG	72	J	79	J	98	J	700	J	130	J
SM21	CALCIUM BY ICAP	MG/KG	19000		19000		6200		11000		12000	
SM22	MAGNESIUM BY ICAP	MG/KG	1800		1400	U	1500	U	2000		1300	
SM23	SODIUM BY ICAP	MG/KG	1300	U	1400	U	1500	U	1500		1300	U
SM24	POTASSIUM BY ICAP	MG/KG	1300	U	1400	U	1500	U	1200	U	1300	
SS01	PHENOL	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS02	CARBAZOLE	UG/KG					14000	U	12000	U	14000	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	011		012		013		101		102	
SS03 BIS(2-CHLOROETHYL) ETHER	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS04 2-CHLOROPHENOL	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS05 1,3-DICHLOROBENZENE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS06 1,4-DICHLOROBENZENE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS07 BENZYL ALCOHOL	UG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SS08 1,2-DICHLOROBENZENE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS09 2-METHYLPHENOL (O-CRESOL)	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS10 BIS(2-CHLOROISOPROPYL) ETHER	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS11 4-METHYLPHENOL (P-CRESOL)	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS12 N-NITROSO-DIPROPYLAMINE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS13 HEXACHLOROETHANE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS14 NITROBENZENE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS15 ISOPHORONE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS16 2-NITROPHENOL	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS17 2,4 DIMETHYLPHENOL	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS18 BENZOIC ACID	UG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SS19 BIS(2-CHLOROETHYOXY) METHANE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS20 2,4 DICHLOROPHENOL	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS21 1,2,4-TRICHLOROBENZENE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS22 NAPHTHALENE	UG/KG	30000		13000	U	55000		12000	U	14000	U
SS23 4-CHLOROANILINE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS24 HEXACHLOROBUTADIENE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS25 4-CHLORO-3-METHYLPHENOL	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS26 2-METHYLNAPHTHALENE	UG/KG	23000		13000	U	14000	U	12000	U	14000	U
SS27 HEXACHLOROCYCLOPENTADIENE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS28 2,4,6-TRICHLOROPHENOL	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	011		012		013		101		102	
SS29 2.4.5-TRICHLOROPHENOL	UG/KG	66000	U	66000	U	74000	U	62000	U	73000	U
SS30 2-CHLORONAPHTHALENE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS31 2-NITROANILINE	UG/KG	66000	U	66000	U	74000	U	62000	U	73000	U
SS32 DIMETHYLPHTHALATE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS33 ACENAPHTHYLENE	UG/KG	20000		13000	U	14000	U	12000	U	14000	U
SS34 3-NITROANILINE	UG/KG	66000	U	66000	U	74000	U	62000	U	73000	U
SS35 ACENAPHTHENE	UG/KG	15000		13000	U	22000		12000	U	14000	U
SS36 2.4-DINITROPHENOL	UG/KG	66000	U	66000	U	74000	U	62000	U	73000	U
SS37 4-NITROPHENOL	UG/KG	66000	U	66000	U	74000	U	62000	U	73000	U
SS38 DIBENZOFURAN	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS39 2.4-DINITROTOLUENE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS40 2.6-DINITROTOLUENE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS41 DIETHYLPHTHALATE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS42 4-CHLOROPHENYL PHENYL ETHER	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS43 FLUORENE	UG/KG	24000		13000	U	21000		12000	U	14000	U
SS44 4-NITROANILINE	UG/KG	66000	U	66000	U	74000	U	62000	U	73000	U
SS45 4.6-DINITRO-2-METHYLPHENOL	UG/KG	66000	U	66000	U	74000	U	62000	U	73000	U
SS46 N-NITROSODIPHENYLAMINE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS47 4-BROMOPHENYL PHENYL ETHER	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS48 HEXACHLOROBENZENE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS49 PENTACHLOROPHENOL	UG/KG	66000	U	66000	U	74000	U	62000	U	73000	U
SS50 PHENANTHRENE	UG/KG	41000		13000	U	59000		12000	U	14000	U
SS51 ANTHRACENE	UG/KG	13000		13000	U	18000		12000	U	14000	U
SS52 DI-N-BUTYL PHTHALATE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS53 FLUORANTHENE	UG/KG	80000		13000	U	90000		12000	U	14000	U
SS54 PYRENE	UG/KG	210000	J	13000	U	85000		12000	U	21000	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	011		012		013		101		102	
SS55 BUTYL BENZYL PHTHALATE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS56 3.3'-DICHLOROBENZIDINE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS57 BENZO(A)ANTHRACENE	UG/KG	99000		13000	U	21000		12000	U	14000	U
SS58 BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS59 CHRYSENE	UG/KG	94000		13000	U	21000		12000	U	14000	U
SS60 DI-N-OCTYL PHTHALATE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS61 BENZO(B)FLUORANTHENE	UG/KG	76000		13000	U	15000		12000	U	14000	U
SS62 BENZO(K)FLUORANTHENE	UG/KG	89000		13000	U	17000		12000	U	14000	U
SS63 BENZO(A)PYRENE	UG/KG	120000		13000	U	23000		12000	U	14000	U
SS64 INDENO(1.2.3-CD)PYRENE	UG/KG	75000		13000	U	14000	U	12000	U	14000	U
SS65 DIBENZO(A.H)ANTHRACENE	UG/KG	13000	U	13000	U	14000	U	12000	U	14000	U
SS66 BENZO(G.H.I)PERYLENE	UG/KG	88000		13000	U	14000	U	12000	U	14000	U
ST09 CYANIDE	MG/KG	250		170		7.6	U	33		6.3	U
SV03 CHLOROMETHANE	UG/KG	3100	U	13	U	1700	U				
SV04 BROMOMETHANE	UG/KG	3100	U	13	U	1700	U				
SV05 VINYL CHLORIDE	UG/KG	3100	U	13	U	1700	U				
SV06 CHLOROETHANE	UG/KG	3100	U	13	U	1700	U				
SV07 METHYLENE CHLORIDE	UG/KG	3100	U	13	U	1700	U				
SV08 1 1-DICHLOROETHYLENE	UG/KG	3100	U	13	U	1700	U				
SV09 1 1-DICHLOROETHANE	UG/KG	3100	U	13	U	1700	U				
SV10 TRANS-1 2-DICHLOROETHYLENE	UG/KG	3100	U	13	U	1700	U				
SV11 CHLOROFORM	UG/KG	3100	U	13	U	1700	U				
SV12 1.2 DICHLOROETHANE	UG/KG	3100	U	13	U	1700	U				
SV13 1.1.1-TRICHLOROETHANE	UG/KG	3100	U	13	U	1700	U				
SV14 CARBON TETRACHLORIDE	UG/KG	3100	U	13	U	1700	U				
SV15 BROMODICHLOROMETHANE	UG/KG	3100	U	13	U	1700	U				

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	011		012		013		101	102
SV16 1,2-DICHLOROPROPANE	UG/KG	3100	U	13	U	1700	U		
SV17 BENZENE	UG/KG	8000		13	U	1800			
SV18 TRANS-1,3-DICHLOROPROPENE	UG/KG	3100	U	13	U	1700	U		
SV19 TRICHLOROETHYLENE	UG/KG	3100	U	13	U	1700	U		
SV20 CIS-1,3-DICHLOROPROPENE	UG/KG	3100	U	13	U	1700	U		
SV21 DIBROMOCHLOROMETHANE	UG/KG	3100	U	13	U	1700	U		
SV22 1,1,2-TRICHLOROETHANE	UG/KG	3100	U	13	U	1700	U		
SV24 BROMOFORM	UG/KG	3100	U	13	U	1700	U		
SV25 1,1,2,2-TETRACHLOROETHENE	UG/KG	3100	U	13	U	1700	U		
SV26 TOLUENE	UG/KG	3100	U	13	U	1700	U		
SV27 1,1,2,2-TETRACHLOROETHANE	UG/KG	3100	U	13	U	1700	U		
SV28 CHLOROBENZENE	UG/KG	3100	U	13	U	1700	U		
SV29 ETHYL BENZENE	UG/KG	34000		13	U	1700	U		
SV30 ACETONE	UG/KG	3100	U	39	U	1700	U		
SV31 CARBON DISULFIDE	UG/KG	3100	U	13	U	1700	U		
SV32 2-BUTANONE	UG/KG	3100	U	13	U	1700	U		
SV33 VINYL ACETATE	UG/KG	NA	O	NA	O	NA	O		
SV34 2-HEXANONE	UG/KG	3100	U	13	U	1700	U		
SV35 4-METHYL-2-PENTANONE	UG/KG	3100	U	13	U	1700	U		
SV36 STYRENE	UG/KG	3100	U	14	J	1700	U		
SV37 XYLENES, TOTAL	UG/KG	25000		13	U	1700	U		
Z201 SAMPLE NUMBER	NA	011		012		013		101	102
Z202 ACTIVITY CODE	NA	DSX44		DSX44		DSX44		DSX44	DSX44

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

	COMPOUND	UNITS	103		104		105		106		107	
SM01	SILVER	BY ICAP	MG/KG	2.4	U	2.3	U	2.3	U	2.4	U	2.2	U
SM02	ALUMINUM	BY ICAP	MG/KG	4200		5700		5200		7700		5000	
SM03	ARSENIC	BY ICAP	MG/KG	5.3		6.0		7.9		5.3		8.1	
SM04	BARIUM	BY ICAP	MG/KG	71		110		190		190		86	
SM05	BERYLLIUM	BY ICAP	MG/KG	1.2	U	1.1	U	1.1	U	1.2	U	1.1	U
SM06	CADMIUM	BY ICAP	MG/KG	1.2	U	1.1	U	1.1	U	1.2	U	1.1	U
SM07	COBALT	BY ICAP	MG/KG	12	U	11	U	11	U	12	U	11	U
SM08	CHROMIUM	BY ICAP	MG/KG	7.0		15		11		11		8.2	
SM09	COPPER	BY ICAP	MG/KG	13		37		38		19		19	
SM10	IRON	BY ICAP	MG/KG	8300		22000		18000		14000		10000	
SM11	MANGANESE	BY ICAP	MG/KG	300		380		240		370		230	
SM12	MOLYBDENUM	BY ICAP	MG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SM13	NICKEL	BY ICAP	MG/KG	9.8		13		12		15		9.2	
SM14	LEAD	BY ICAP	MG/KG	66	J	59	J	81	J	59	J	200	J
SM15	ANTIMONY	BY ICAP	MG/KG	14	U	14	U	14	U	14	U	13	U
SM16	SELENIUM	BY ICAP	MG/KG	1.2	U	1.1	U	1.1	U	1.3		1.1	U
SM17	TITANIUM	BY ICAP	MG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SM18	THALLIUM	BY ICAP	MG/KG	2.4	U	2.3	U	2.3	U	2.4	U	2.2	U
SM19	VANADIUM	BY ICAP	MG/KG	12		20		17		20		12	
SM20	ZINC	BY ICAP	MG/KG	53	J	110	J	170	J	71	J	77	J
SM21	CALCIUM	BY ICAP	MG/KG	58000		59000		26000		29000		79000	
SM22	MAGNESIUM	BY ICAP	MG/KG	7000		9600		2300		5000		7600	
SM23	SODIUM	BY ICAP	MG/KG	1200	U	1100	U	1100	U	12000		1100	U
SM24	POTASSIUM	BY ICAP	MG/KG	1200	U	1100	U	1100	U	1500		1100	U
SS01	PHENOL		UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS02	CARBAZOLE		UG/KG	10000	U	11000	U	12000	U	380	U	11000	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	103		104		105		106		107	
SS03 BIS(2-CHLOROETHYL) ETHER	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS04 2-CHLOROPHENOL	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS05 1.3-DICHLOROBENZENE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS06 1.4-DICHLOROBENZENE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS07 BENZYL ALCOHOL	UG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SS08 1.2-DICHLOROBENZENE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS09 2-METHYLPHENOL (O-CRESOL)	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS10 BIS(2-CHLOROISOPROPYL) ETHER	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS11 4-METHYLPHENOL (P-CRESOL)	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS12 N-NITROSO-DIPROPYLAMINE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS13 HEXACHLOROETHANE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS14 NITROBENZENE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS15 ISOPHORONE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS16 2-NITROPHENOL	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS17 2.4-DIMETHYLPHENOL	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS18 BENZOIC ACID	UG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SS19 BIS(2-CHLOROETHYOXY) METHANE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS20 2.4-DICHLOROPHENOL	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS21 1.2.4-TRICHLOROBENZENE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS22 NAPHTHALENE	UG/KG	10000	U	11000	U	12000	U	380	U	50000	
SS23 4-CHLOROANILINE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS24 HEXACHLOROBUTADIENE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS25 4-CHLORO-3-METHYLPHENOL	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS26 2-METHYLNAPHTHALENE	UG/KG	10000	U	11000	U	12000	U	380	U	13000	
SS27 HEXACHLOROCYCLOPENTADIENE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS28 2.4.6-TRICHLOROPHENOL	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	103		104		105		106		107	
SS29 2.4.5-TRICHLOROPHENOL	UG/KG	54000	U	58000	U	60000	U	2000	U	57000	U
SS30 2-CHLORONAPHTHALENE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS31 2-NITROANILINE	UG/KG	54000	U	58000	U	60000	U	2000	U	57000	U
SS32 DIMETHYLPHTHALATE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS33 ACENAPHTHYLENE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS34 3-NITROANILINE	UG/KG	54000	U	58000	U	60000	U	2000	U	57000	U
SS35 ACENAPHTHENE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS36 2,4-DINITROPHENOL	UG/KG	54000	U	58000	U	60000	U	2000	U	57000	U
SS37 4-NITROPHENOL	UG/KG	54000	U	58000	U	60000	U	2000	U	57000	U
SS38 DIBENZOFURAN	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS39 2,4-DINITROTOLUENE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS40 2,6-DINITROTOLUENE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS41 DIETHYLPHTHALATE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS42 4-CHLOROPHENYL PHENYL ETHER	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS43 FLUORENE	UG/KG	10000	U	11000	U	12000		380	U	11000	U
SS44 4-NITROANILINE	UG/KG	54000	U	58000	U	60000	U	2000	U	57000	U
SS45 4,6-DINITRO-2-METHYLPHENOL	UG/KG	54000	U	58000	U	60000	U	2000	U	57000	U
SS46 N-NITROSODIPHENYLAMINE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS47 4-BROMOPHENYL PHENYL ETHER	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS48 HEXACHLOROBENZENE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS49 PENTACHLOROPHENOL	UG/KG	54000	U	58000	U	60000	U	2000	U	57000	U
SS50 PHENANTHRENE	UG/KG	10000	U	20000		55000		1500		11000	U
SS51 ANTHRACENE	UG/KG	10000	U	11000	U	15000		380	U	11000	U
SS52 DI N-BUTYL PHTHALATE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS53 FLUORANTHENE	UG/KG	10000	U	24000		38000		2000		11000	U
SS54 PYRENE	UG/KG	13000		50000		83000		2200		11000	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	103		104		105		106		107	
SS55 BUTYL BENZYL PHTHALATE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS56 3,3'-DICHLOROBENZIDINE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS57 BENZO(A)ANTHRACENE	UG/KG	10000	U	21000		28000		1300		11000	U
SS58 BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS59 CHRYSENE	UG/KG	10000	U	29000		29000		1200		11000	U
SS60 DI-N-OCTYL PHTHALATE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS61 BENZO(B)FLUORANTHENE	UG/KG	10000	U	11000	U	17000		1000		11000	U
SS62 BENZO(K)FLUORANTHENE	UG/KG	10000	U	11000	U	12000		890		11000	U
SS63 BENZO(A)PYRENE	UG/KG	10000	U	16000		22000		1100		11000	U
SS64 INDENO(1,2,3-CD)PYRENE	UG/KG	10000	U	11000	U	12000	U	660		11000	U
SS65 DIBENZO(A,H)ANTHRACENE	UG/KG	10000	U	11000	U	12000	U	380	U	11000	U
SS66 BENZO(G,H,I)PERYLENE	UG/KG	10000	U	11000	U	12000		710		11000	U
ST09 CYANIDE	MG/KG	94		220		190		5.9	U	94	
ZZ01 SAMPLE NUMBER	NA	103		104		105		106		107	
ZZ02 ACTIVITY CODE	NA	DSX44		DSX44		DSX44		DSX44		DSX44	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

	COMPOUND	UNITS	108		109		110		111		112	
SM01	SILVER	BY ICAP	MG/KG	2.6	U	2.4	U	2.5	U	2.5	U	2.7	U
SM02	ALUMINUM	BY ICAP	MG/KG	5200		6600		11000		3800		7600	
SM03	ARSENIC	BY ICAP	MG/KG	14		11		10		7.8		33	
SM04	BARIUM	BY ICAP	MG/KG	160		150		220		96		170	
SM05	BERYLLIUM	BY ICAP	MG/KG	1.3	U	1.2	U	1.2	U	1.2	U	1.3	U
SM06	CADMIUM	BY ICAP	MG/KG	8.2		1.2	U	1.2	U	1.2	U	1.3	U
SM07	COBALT	BY ICAP	MG/KG	13	U	12	U	12	U	12	U	13	U
SM08	CHROMIUM	BY ICAP	MG/KG	20		15		23		15		12	
SM09	COPPER	BY ICAP	MG/KG	270		93		56		72		43	
SM10	IRON	BY ICAP	MG/KG	21000		28000		29000		33000		24000	
SM11	MANGANESE	BY ICAP	MG/KG	180		390		470	J	320	J	870	J
SM12	MOLYBDENUM	BY ICAP	MG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SM13	NICKEL	BY ICAP	MG/KG	14		20		23		27		23	
SM14	LEAD	BY ICAP	MG/KG	270	J	230	J	230	J	150	J	300	J
SM15	ANTIMONY	BY ICAP	MG/KG	15	U	14	U	15	U	15	U	16	U
SM16	SELENIUM	BY ICAP	MG/KG	2.3		1.6		3.0	J	1.9		1.5	J
SM17	TITANIUM	BY ICAP	MG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SM18	THALLIUM	BY ICAP	MG/KG	2.6	U	2.4	U	2.5	U	2.5	U	2.7	U
SM19	VANADIUM	BY ICAP	MG/KG	25		23		32		17		23	
SM20	ZINC	BY ICAP	MG/KG	2500	J	550	J	360		250		530	
SM21	CALCIUM	BY ICAP	MG/KG	2700		33000		28000		3600		37000	
SM22	MAGNESIUM	BY ICAP	MG/KG	1300	U	2300		3300		1200	U	6400	
SM23	SODIUM	BY ICAP	MG/KG	1300	U	1200	U	1200	U	1200	U	1300	U
SM24	POTASSIUM	BY ICAP	MG/KG	1300	U	1200	U	1200		1200	U	1300	
SS01	PHENOL		UG/KG	390	U	420	U	390	U	390	U	410	U
SS02	CARBAZOLE		UG/KG	420	J	500		390	U	390	U	410	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	108		109		110		111		112	
SS03 BIS(2-CHLOROETHYL) ETHER	UG/KG	390	U	420	U	390	U	390	U	410	U
SS04 2-CHLOROPHENOL	UG/KG	390	U	420	U	390	U	390	U	410	U
SS05 1,3-DICHLOROBENZENE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS06 1,4-DICHLOROBENZENE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS07 BENZYL ALCOHOL	UG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SS08 1,2-DICHLOROBENZENE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS09 2-METHYLPHENOL (O-CRESOL)	UG/KG	390	U	420	U	390	U	390	U	410	U
SS10 BIS(2-CHLOROISOPROPYL) ETHER	UG/KG	390	U	420	U	390	U	390	U	410	U
SS11 4-METHYLPHENOL (P-CRESOL)	UG/KG	390	U	420	U	390	U	390	U	410	U
SS12 N-NITROSO-DIPROPYLAMINE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS13 HEXACHLOROETHANE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS14 NITROBENZENE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS15 ISOPHORONE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS16 2-NITROPHENOL	UG/KG	390	U	420	U	390	U	390	U	410	U
SS17 2,4-DIMETHYLPHENOL	UG/KG	390	U	420	U	390	U	390	U	410	U
SS18 BENZOIC ACID	UG/KG	NA	O	NA	O	NA	O	NA	O	NA	O
SS19 BIS(2-CHLOROETHYOXY) METHANE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS20 2,4-DICHLOROPHENOL	UG/KG	390	U	420	U	390	U	390	U	410	U
SS21 1,2,4-TRICHLOROBENZENE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS22 NAPHTHALENE	UG/KG	1100		510		390	U	390	U	410	U
SS23 4-CHLOROANILINE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS24 HEXACHLOROBUTADIENE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS25 4-CHLORO-3-METHYLPHENOL	UG/KG	390	U	420	U	390	U	390	U	410	U
SS26 2-METHYLNAPHTHALENE	UG/KG	2500		420	U	390	U	390	U	410	U
SS27 HEXACHLOROCYCLOPENTADIENE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS28 2,4,6-TRICHLOROPHENOL	UG/KG	390	U	420	U	390	U	390	U	410	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	108		109		110		111		112	
SS29 2.4.5-TRICHLOROPHENOL	UG/KG	940	U	1000	U	950	U	940	U	990	U
SS30 2-CHLORONAPHTHALENE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS31 2-NITROANILINE	UG/KG	940	U	1000	U	950	U	940	U	990	U
SS32 DIMETHYLPHTHALATE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS33 ACENAPHTHYLENE	UG/KG	2400		460		390	U	390	U	410	U
SS34 3-NITROANILINE	UG/KG	940	U	1000	U	950	U	940	U	990	U
SS35 ACENAPHTHENE	UG/KG	690		420	U	390	U	390	U	410	U
SS36 2.4-DINITROPHENOL	UG/KG	940	U	1000	U	950	U	940	U	990	U
SS37 4-NITROPHENOL	UG/KG	940	U	1000	U	950	U	940	U	990	U
SS38 DIBENZOFURAN	UG/KG	1100		420	U	390	U	390	U	410	U
SS39 2.4-DINITROTOLUENE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS40 2.6-DINITROTOLUENE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS41 DIETHYLPHTHALATE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS42 4-CHLOROPHENYL PHENYL ETHER	UG/KG	390	U	420	U	390	U	390	U	410	U
SS43 FLUORENE	UG/KG	3100		460	J	390	U	390	U	410	U
SS44 4-NITROANILINE	UG/KG	940	U	1000	U	950	U	940	U	990	U
SS45 4.6-DINITRO-2-METHYLPHENOL	UG/KG	940	U	1000	U	950	U	940	U	990	U
SS46 N-NITROSODIPHENYLAMINE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS47 4-BROMOPHENYL PHENYL ETHER	UG/KG	390	U	420	U	390	U	390	U	410	U
SS48 HEXACHLOROBENZENE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS49 PENTACHLOROPHENOL	UG/KG	940	U	1000	U	950	U	940	U	990	U
SS50 PHENANTHRENE	UG/KG	43000	J	2200		1500		850		440	
SS51 ANTHRACENE	UG/KG	4700	J	780		390	U	390	U	410	U
SS52 DI N-BUTYL PHTHALATE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS53 FLUORANTHENE	UG/KG	40000	J	2800		2200		770		1300	
SS54 PYRENE	UG/KG	58000	J	3700		2300		810		1400	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 . VALIDATED DATA

COMPOUND	UNITS	108		109		110		111		112	
SS55 BUTYL BENZYL PHTHALATE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS56 3.3'-DICHLOROBENZIDINE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS57 BENZO(A)ANTHRACENE	UG/KG	34000	J	3500		1500		480		790	
SS58 BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS59 CHRYSENE	UG/KG	34000	J	4300		1600		550		850	
SS60 DI-N-OCTYL PHTHALATE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS61 BENZO(B)FLUORANTHENE	UG/KG	16000	J	4900		1100		440		610	
SS62 BENZO(K)FLUORANTHENE	UG/KG	390	U	3400		1200		450		680	
SS63 BENZO(A)PYRENE	UG/KG	20000	J	4200		1300		440		700	
SS64 INDENO(1.2.3-CD)PYRENE	UG/KG	12000	J	2700		760		390	U	410	U
SS65 DIBENZO(A.H)ANTHRACENE	UG/KG	390	U	420	U	390	U	390	U	410	U
SS66 BENZO(G.H.I)PERYLENE	UG/KG	14000	J	2600		760		390	U	410	U
ST09 CYANIDE	MG/KG	98		35		6.2	U	6.2	U	6.7	U
ZZ01 SAMPLE NUMBER	NA	108		109		110		111		112	
ZZ02 ACTIVITY CODE	NA	DSX44		DSX44		DSX44		DSX44		DSX44	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	201		202		203		204		205F	
WF01 WATER TEMP	°C	11.0		7.0		9.0		9.0			
WF05 PH, FIELD	SU	7.58		7.81		6.32		6.21			
WF10 CONDUCTIVITY (FIELD)	UMHOS	1500		2000		1500		1400			
WM01 SILVER BY ICAP	UG/L	10	U	10	U	10	U	10	U	10	U
WM02 ALUMINUM BY ICAP	UG/L	45000	J	15000	J	200	U	200	U	200	U
WM03 ARSENIC BY ICAP	UG/L	40		670		15	J	10	U	10	U
WM04 BARIUM BY ICAP	UG/L	2100		890		1000		630		200	U
WM05 BERYLLIUM BY ICAP	UG/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
WM06 CADMIUM BY ICAP	UG/L	5.0	U	5.0	U	19		21		5.0	U
WM07 COBALT BY ICAP	UG/L	50	U	50	U	50	U	50	U	50	U
WM08 CHROMIUM BY ICAP	UG/L	68		29		10	U	10	U	10	U
WM09 COPPER BY ICAP	UG/L	84	J	91	J	37	U	27	U	200	
WM10 IRON BY ICAP	UG/L	110000		53000		30000		15000	U	320	U
WM11 MANGANESE BY ICAP	UG/L	5600		850		1300		630		32	U
WM12 MOLYBDENUM BY ICAP	UG/L	NA	O	NA	O	NA	O	NA	O	N/A	O
WM13 NICKEL BY ICAP	UG/L	95		40	U	40	U	40	U	40	U
WM14 LEAD BY ICAP	UG/L	58		1200	J	330		350		3 6	U
WM15 ANTIMONY BY ICAP	UG/L	60	U	60	U	60	U	60	U	60	U
WM16 SELENIUM BY ICAP	UG/L	25	U	25	U	NA	I	NA	I	N/A	I
WM17 TITANIUM BY ICAP	UG/L	NA	O	NA	O	NA	O	NA	O	N/A	O
WM18 THALLIUM BY ICAP	UG/L	10	U	50	U	NA	I	NA	I	N/A	I
WM19 VANADIUM BY ICAP	UG/L	77		50	U	50	U	50	U	50	U
WM20 ZINC BY ICAP	UG/L	4200		1100		40000		35000		11	U
WM21 CALCIUM, TOTAL BY ICAP	MG/L	520		320		210	U	230	U	50	
WM22 MAGNESIUM, TOTAL BY ICAP	MG/L	66		44		37	U	34	U	19	
WM23 SODIUM, TOTAL BY ICAP	MG/L	110		150		99		64	U	19	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	201	202	203	204	205F
WM24 POTASSIUM, TOTAL BY ICAP	MG/L	53	46	33	26	5.0 U
WM35 SILVER,DISSOLVED BY ICAP	UG/L	10 U	10 U	10 U	10 U	
WM36 ALUMINUM,DISSOLVED BY ICAP	UG/L	200 U	200 U	200 U	200 U	
WM37 ARSENIC,DISSOLVED BY ICAP	UG/L	13	80 J	14 U	10 U	
WM38 BARIUM,DISSOLVED BY ICAP	UG/L	490	260	650	490	
WM39 BERYLLIUM,DISSOLVED BY ICAP	UG/L	5.0 U	5.0 U	5.0 U	5.0 U	
WM40 CADMIUM,DISSOLVED BY ICAP	UG/L	5.0 U	5.0 U	5.0 U	5.0 U	
WM41 COBALT,DISSOLVED BY ICAP	UG/L	50 U	50 U	50 U	50 U	
WM42 CHROMIUM,DISSOLVED BY ICAP	UG/L	10 U	10 U	10 U	10 U	
WM43 COPPER,DISSOLVED BY ICAP	UG/L	25 U	25 U	25 U	25 U	
WM44 IRON,DISSOLVED BY ICAP	UG/L	1500 J	14000 J	20000	11000	
WM45 MANGANESE,DISSOLVED BY ICAP	UG/L	1500	540	1100	600	
WM46 MOLYBDENUM,DISSOLVED BY ICAP	UG/L	NA O	NA O	NA O	NA O	
WM47 NICKEL,DISSOLVED BY ICAP	UG/L	40 U	40 U	34 U	40 U	
WM48 LEAD,DISSOLVED BY ICAP	UG/L	5.0 J	3.0 U	3.8 U	5.3 U	
WM49 ANTIMONY,DISSOLVED BY ICAP	UG/L	60 U	60 U	60 U	60 U	
WM50 SELENIUM,DISSOLVED BY ICAP	UG/L	5.0 U	5.0 U	5.0 U	20 U	
WM51 TITANIUM,DISSOLVED BY ICAP	UG/L	NA O	NA O	NA O	NA O	
WM52 THALLIUM,DISSOLVED BY ICAP	UG/L	10 U	50 U	10 U	10 U	
WM53 VANADIUM,DISSOLVED BY ICAP	UG/L	50 U	50 U	50 U	50 U	
WM54 ZINC,DISSOLVED BY ICAP	UG/L	44	23	690 J	3400 J	
WM55 CALCIUM,DISSOLVED BY ICAP	MG/L	170	270	220	250	
WM56 MAGNESIUM,DISSOLVED BY ICAP	MG/L	41	42	39 U	35	
WM57 SODIUM,DISSOLVED BY ICAP	MG/L	100	150	100	66	
WM58 POTASSIUM,DISSOLVED BY ICAP	MG/L	33	44	NA O	26	
WS01 PHENOL	UG/L	10 U	10 U	10 U	10 U	10 U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	201		202		203		204		205F	
WS03 BIS(2-CHLOROETHYL) ETHER	UG/L	10	U	10	U	10	U	10	U	10	U
WS04 2-CHLOROPHENOL	UG/L	10	U	10	U	10	U	10	U	10	U
WS05 1,3-DICHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS06 1,4-DICHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS07 BENZYL ALCOHOL	UG/L	10	U	10	U	10	U	10	U	10	U
WS08 1,2-DICHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS09 2-METHYLPHENOL (O-CRESOL)	UG/L	10	U	10	U	10	U	10	U	10	U
WS10 BIS(2-CHLOROISOPROPYL) ETHER	UG/L	10	U	10	U	10	U	10	U	10	U
WS11 4-METHYLPHENOL (P-CRESOL)	UG/L	10	U	10	U	10	U	10	U	10	U
WS12 N-NITROSO-DIPROPYLAMINE	UG/L	10	U	10	U	10	U	10	U	10	U
WS13 HEXACHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WS14 NITROBENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS15 ISOPHORONE	UG/L	10	U	10	U	10	U	10	U	10	U
WS16 2-NITROPHENOL	UG/L	10	U	10	U	10	U	10	U	10	U
WS17 2,4-DIMETHYLPHENOL	UG/L	10	U	10	U	10	U	10	U	10	U
WS18 BENZOIC ACID	UG/L	50	U	50	U	50	U	50	U	50	U
WS19 BIS(2-CHLOROETHYOXY) METHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WS20 2,4-DICHLOROPHENOL	UG/L	10	U	10	U	10	U	10	U	10	U
WS21 1,2,4-TRICHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS22 NAPHTHALENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS23 4-CHLOROANILINE	UG/L	10	U	10	U	10	U	10	U	10	U
WS24 HEXACHLOROBUTADIENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS25 4-CHLORO-3-METHYLPHENOL	UG/L	10	U	10	U	10	U	10	U	10	U
WS26 2-METHYLNAPHTHALENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS27 HEXACHLOROCYCLOPENTADIENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS28 2,4,6-TRICHLOROPHENOL	UG/L	10	U	10	U	10	U	10	U	10	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	201		202		203		204		205F	
WS29 2,4,5-TRICHLOROPHENOL	UG/L	25	U	25	U	25	U	25	U	25	U
WS30 2-CHLORONAPHTHALENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS31 2-NITROANILINE (ORTHO NITROANILINE)	UG/L	25	U	25	U	25	U	25	U	25	U
WS32 DIMETHYLPHTHALATE	UG/L	10	U	10	U	10	U	10	U	10	U
WS33 ACENAPHTHYLENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS34 3-NITROANILINE	UG/L	25	U	25	U	25	U	25	U	25	U
WS35 ACENAPHTHENE	UG/L	10	U	10	U	10	U	65		10	U
WS36 2,4-DINITROPHENOL	UG/L	25	U	25	U	25	U	25	U	25	U
WS37 4-NITROPHENOL	UG/L	25	U	25	U	25	U	25	U	25	U
WS38 DIBENZOFURAN	UG/L	10	U	10	U	10	U	10	U	10	U
WS39 2,4-DINITROTOLUENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS40 2,6-DINITROTOLUENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS41 DIETHYLPHTHALATE	UG/L	10	U	10	U	10	U	10	U	10	U
WS42 4-CHLOROPHENYL PHENYL ETHER	UG/L	10	U	10	U	10	U	10	U	10	U
WS43 FLUORENE	UG/L	10	U	10	U	10	U	25		10	U
WS44 4-NITROANILINE	UG/L	25	U	25	U	25	U	25	U	25	U
WS45 4,6-DINITRO-2-METHYLPHENOL	UG/L	25	U	25	U	25	U	25	U	25	U
WS46 N-NITROSODIPHENYLAMINE	UG/L	10	U	10	U	10	U	10	U	10	U
WS47 4-BROMOPHENYL PHENYL ETHER	UG/L	10	U	10	U	10	U	10	U	10	U
WS48 HEXACHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS49 PENTACHLOROPHENOL	UG/L	25	U	25	U	25	U	25	U	25	U
WS50 PHENANTHRENE	UG/L	10	U	10	U	10	U	16		10	U
WS51 ANTHRACENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS52 DI-N-BUTYL PHTHALATE	UG/L	10	U	10	U	10	U	10	U	10	U
WS53 FLUORANTHENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS54 PYRENE	UG/L	10	U	10	U	10	U	10	U	10	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	201		202		203		204		205F	
WS55 BUTYL BENZYL PHTHALATE	UG/L	10	U	10	U	10	U	10	U	10	U
WS56 3,3'-DICHLOROBENZIDINE	UG/L	10	U	10	U	10	U	10	U	10	U
WS57 BENZO(A)ANTHRACENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS58 BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	10	U	10	U	10	U	10	U	10	U
WS59 CHRYSENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS60 DI-N-OCTYL PHTHALATE	UG/L	10	U	10	U	10	U	10	U	10	U
WS61 BENZO(B)FLUORANTHENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS62 BENZO(K)FLUORANTHENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS63 BENZO(A)PYRENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS64 INDENO(1,2,3-CD)PYRENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS65 DIBENZO(A,H)ANTHRACENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS66 BENZO(G,H,I)PERYLENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS67 CARBAZOLE	UG/L	10	U	10	U	10	U	10	U	10	U
WT09 CYANIDE, TOTAL	MG/L	0.52	J	0.027	J	0.590	J	1.6	J	0.013	J
WV03 CHLOROMETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV04 BROMOMETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV05 VINYL CHLORIDE	UG/L	10	U	10	U	10	U	10	U	10	U
WV06 CHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV07 METHYLENE CHLORIDE	UG/L	10	U	10	U	10	U	10	U	10	U
WV08 1,1-DICHLOROETHENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV09 1,1-DICHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV10 1,2-DICHLOROETHENE, TOTAL	UG/L	10	U	10	U	10	U	10	U	10	U
WV11 CHLOROFORM	UG/L	10	U	10	U	10	U	10	U	17	
WV12 1,2-DICHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV13 1,1,1-TRICHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV14 CARBON TETRACHLORIDE	UG/L	10	U	10	U	10	U	10	U	10	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	201		202		203		204		205F	
WV15 BROMODICHLOROMETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV16 1,2-DICHLOROPROPANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV17 BENZENE	UG/L	10	U	10	U	10	U	93		10	U
WV19 TRICHLOROETHENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV20 CIS-1,3-DICHLOROPROPENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV21 DIBROMOCHLOROMETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV22 1,1,2-TRICHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV24 BROMOFORM	UG/L	10	U	10	U	10	U	10	U	10	U
WV25 TETRACHLOROETHENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV26 TOLUENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV27 1,1,2,2-TETRACHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV28 CHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV29 ETHYL BENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV30 ACETONE	UG/L	10	U	10	U	10	U	10	U	10	U
WV31 CARBON DISULFIDE	UG/L	10	U	10	U	10	U	10	U	10	U
WV32 2-BUTANONE	UG/L	10	U	10	U	10	U	10	U	10	U
WV33 VINYL ACETATE	UG/L	10	U	10	U	10	U	10	U	10	U
WV34 2-HEXANONE	UG/L	10	U	10	U	10	U	10	U	10	U
WV35 4-METHYL-2-PENTANONE	UG/L	10	U	10	U	10	U	10	U	10	U
WV36 STYRENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV37 XYLENES, TOTAL	UG/L	10	U	10	U	10	U	10	U	10	U
WV40 TRANS-1,3-DICHLOROPROPENE	UG/L	10	U	10	U	10	U	10	U	10	U
Z201 SAMPLE NUMBER	NA	201		202		203		204		205	
Z202 ACTIVITY CODE	NA	DSX44		DSX44		DSX44		DSX44		DSX44	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	206		206D		207F		208F		209F
WF01 WATER TEMP	°C	11.0		11.0						
WF05 PH, FIELD	SU	6.14		6.14						
WF10 CONDUCTIVITY (FIELD)	UMHOS	1600		1600						
WM01 SILVER BY ICAP	UG/L	10	U	10	U	10	U	10	U	
WM02 ALUMINUM BY ICAP	UG/L	200	U	200	U	200	U	310		
WM03 ARSENIC BY ICAP	UG/L	47	J	81	J	10	U	10	U	
WM04 BARIUM BY ICAP	UG/L	490		590		200	U	200	U	
WM05 BERYLLIUM BY ICAP	UG/L	5.0	U	5.0	U	5.0	U	5.0	U	
WM06 CADMIUM BY ICAP	UG/L	35		140		5.0	U	5.0	U	
WM07 COBALT BY ICAP	UG/L	50	U	50	U	50	U	50	U	
WM08 CHROMIUM BY ICAP	UG/L	10	U	10	U	10	U	16	J	
WM09 COPPER BY ICAP	UG/L	32	U	190	U	25	U	25	U	
WM10 IRON BY ICAP	UG/L	29000		34000		100	U	5000		
WM11 MANGANESE BY ICAP	UG/L	410		440		15	U	39		
WM12 MOLYBDENUM BY ICAP	UG/L	NA	O	NA	O	NA	O	N/A	O	
WM13 NICKEL BY ICAP	UG/L	40	U	40	U	40	U	40	U	
WM14 LEAD BY ICAP	UG/L	480		1500		3.6	U	32		
WM15 ANTIMONY BY ICAP	UG/L	60	U	60	U	60	U	60	U	
WM16 SELENIUM BY ICAP	UG/L	NA	I	NA	I	NA	O	N/A	I	
WM17 TITANIUM BY ICAP	UG/L	NA	O	NA	O	NA	O	N/A	O	
WM18 THALLIUM BY ICAP	UG/L	NA	I	NA	I	NA	O	N/A	I	
WM19 VANADIUM BY ICAP	UG/L	50	U	50	U	50	U	50	U	
WM20 ZINC BY ICAP	UG/L	26000		80000		21	U	63		
WM21 CALCIUM, TOTAL BY ICAP	MG/L	220	U	220	U	5.0	U	7.3	U	
WM22 MAGNESIUM, TOTAL BY ICAP	MG/L	52	U	52	U	5.0	U	5.0	U	
WM23 SODIUM, TOTAL BY ICAP	MG/L	230		230		5.0	U	5.0	U	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	206		206D		207F		208F		209F
WM24 POTASSIUM, TOTAL BY ICAP	MG/L	12	U	12	U	5.0	U	5.0	U	
WM35 SILVER,DISSOLVED BY ICAP	UG/L	10	U	10	U	10	U	10	U	
WM36 ALUMINUM,DISSOLVED BY ICAP	UG/L	200	U	200	U	200	U	200	U	
WM37 ARSENIC,DISSOLVED BY ICAP	UG/L	29	J	41		10	U	10	U	
WM38 BARIUM,DISSOLVED BY ICAP	UG/L	400		440		200	U	200	U	
WM39 BERYLLIUM,DISSOLVED BY ICAP	UG/L	5	U	5.0	U	5.0	U	5.0	U	
WM40 CADMIUM,DISSOLVED BY ICAP	UG/L	5	U	5.0	U	5.0	U	5.0	U	
WM41 COBALT,DISSOLVED BY ICAP	UG/L	50	U	50	U	50	U	50	U	
WM42 CHROMIUM,DISSOLVED BY ICAP	UG/L	10	U	10	U	10	U	10	U	
WM43 COPPER,DISSOLVED BY ICAP	UG/L	25	U	25	U	25	U	25	U	
WM44 IRON,DISSOLVED BY ICAP	UG/L	24000	U	27000		100	U	100	U	
WM45 MANGANESE,DISSOLVED BY ICAP	UG/L	380		400		15	U	15	U	
WM46 MOLYBDENUM,DISSOLVED BY ICAP	UG/L	NA	O	NA	O	NA	O	N/A	O	
WM47 NICKEL,DISSOLVED BY ICAP	UG/L	40	U	40	U	40	U	40	U	
WM48 LEAD,DISSOLVED BY ICAP	UG/L	4.0	U	4.8	U	3.0	U	3.0	U	
WM49 ANTIMONY,DISSOLVED BY ICAP	UG/L	60	U	60	U	60	U	60	U	
WM50 SELENIUM,DISSOLVED BY ICAP	UG/L	NA	I	20	U	5.0	U	5.0	U	
WM51 TITANIUM,DISSOLVED BY ICAP	UG/L	NA	O	NA	O	NA	O	N/A	O	
WM52 THALLIUM,DISSOLVED BY ICAP	UG/L	NA	I	10	U	10	U	10	U	
WM53 VANADIUM,DISSOLVED BY ICAP	UG/L	50	U	50	U	50	U	50	U	
WM54 ZINC,DISSOLVED BY ICAP	UG/L	2000		3200	J	20	U	20	U	
WM55 CALCIUM,DISSOLVED BY ICAP	MG/L	220	U	240		5.0	U	5.0	U	
WM56 MAGNESIUM,DISSOLVED BY ICAP	MG/L	51	U	55		5.0	U	5.0	U	
WM57 SODIUM,DISSOLVED BY ICAP	MG/L	230		230		5.0	U	5.0	U	
WM58 POTASSIUM,DISSOLVED BY ICAP	MG/L	12	U	12		5.0	U	5.0	U	
WS01 PHENOL	UG/L	10	U	10	U	10	U	10	U	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	206		206D		207F		208F		209F
WS03 BIS(2-CHLOROETHYL) ETHER	UG/L	10	U	10	U	10	U	10	U	
WS04 2-CHLOROPHENOL	UG/L	10	U	10	U	10	U	10	U	
WS05 1,3-DICHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	
WS06 1,4-DICHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	
WS07 BENZYL ALCOHOL	UG/L	10	U	10	U	10	U	10	U	
WS08 1,2-DICHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	
WS09 2-METHYLPHENOL (O-CRESOL)	UG/L	10	U	10	U	10	U	10	U	
WS10 BIS(2-CHLOROISOPROPYL) ETHER	UG/L	10	U	10	U	10	U	10	U	
WS11 4-METHYLPHENOL (P-CRESOL)	UG/L	10	U	10	U	10	U	10	U	
WS12 N-NITROSO-DIPROPYLAMINE	UG/L	10	U	10	U	10	U	10	U	
WS13 HEXACHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	
WS14 NITROBENZENE	UG/L	10	U	10	U	10	U	10	U	
WS15 ISOPHORONE	UG/L	10	U	10	U	10	U	10	U	
WS16 2-NITROPHENOL	UG/L	10	U	10	U	10	U	10	U	
WS17 2,4-DIMETHYLPHENOL	UG/L	10	U	10	U	10	U	10	U	
WS18 BENZOIC ACID	UG/L	50	U	50	U	50	U	50	U	
WS19 BIS(2-CHLOROETHYOXY) METHANE	UG/L	10	U	10	U	10	U	10	U	
WS20 2,4-DICHLOROPHENOL	UG/L	10	U	10	U	10	U	10	U	
WS21 1,2,4-TRICHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	
WS22 NAPHTHALENE	UG/L	10	U	10	U	10	U	10	U	
WS23 4-CHLOROANILINE	UG/L	10	U	10	U	10	U	10	U	
WS24 HEXACHLOROBUTADIENE	UG/L	10	U	10	U	10	U	10	U	
WS25 4-CHLORO-3-METHYLPHENOL	UG/L	10	U	10	U	10	U	10	U	
WS26 2-METHYLNAPHTHALENE	UG/L	10	U	10	U	10	U	10	U	
WS27 HEXACHLOROCYCLOPENTADIENE	UG/L	10	U	10	U	10	U	10	U	
WS28 2,4,6-TRICHLOROPHENOL	UG/L	10	U	10	U	10	U	10	U	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	206		206D		207F		208F		209F
WS29 2,4,5-TRICHLOROPHENOL	UG/L	25	U	25	U	25	U	25	U	
WS30 2-CHLORONAPHTHALENE	UG/L	10	U	10	U	10	U	10	U	
WS31 2-NITROANILINE (ORTHO NITROANILINE)	UG/L	25	U	25	U	25	U	25	U	
WS32 DIMETHYLPHTHALATE	UG/L	10	U	10	U	10	U	10	U	
WS33 ACENAPHTHYLENE	UG/L	10	U	10	U	10	U	10	U	
WS34 3-NITROANILINE	UG/L	25	U	25	U	25	U	25	U	
WS35 ACENAPHTHENE	UG/L	10	U	10	U	10	U	10	U	
WS36 2,4-DINITROPHENOL	UG/L	25	U	25	U	25	U	25	U	
WS37 4-NITROPHENOL	UG/L	25	U	25	U	25	U	25	U	
WS38 DIBENZOFURAN	UG/L	10	U	10	U	10	U	10	U	
WS39 2,4-DINITROTOLUENE	UG/L	10	U	10	U	10	U	10	U	
WS40 2,6-DINITROTOLUENE	UG/L	10	U	10	U	10	U	10	U	
WS41 DIETHYLPHTHALATE	UG/L	10	U	10	U	10	U	10	U	
WS42 4-CHLOROPHENYL PHENYL ETHER	UG/L	10	U	10	U	10	U	10	U	
WS43 FLUORENE	UG/L	10	U	10	U	10	U	10	U	
WS44 4-NITROANILINE	UG/L	25	U	25	U	25	U	25	U	
WS45 4,6-DINITRO-2-METHYLPHENOL	UG/L	25	U	25	U	25	U	25	U	
WS46 N-NITROSODIPHENYLAMINE	UG/L	10	U	10	U	10	U	10	U	
WS47 4-BROMOPHENYL PHENYL ETHER	UG/L	10	U	10	U	10	U	10	U	
WS48 HEXACHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	
WS49 PENTACHLOROPHENOL	UG/L	25	U	25	U	25	U	25	U	
WS50 PHENANTHRENE	UG/L	10	U	10	U	10	U	10	U	
WS51 ANTHRACENE	UG/L	10	U	10	U	10	U	10	U	
WS52 DI-N-BUTYL PHTHALATE	UG/L	10	U	10	U	10	U	10	U	
WS53 FLUORANTHENE	UG/L	10	U	10	U	10	U	10	U	
WS54 PYRENE	UG/L	10	U	10	U	10	U	10	U	

ANALYSIS REQUEST DETAIL REPORT . ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	206		206D		207F		208F		209F	
WS55 BUTYL BENZYL PHTHALATE	UG/L	10	U	10	U	10	U	10	U		
WS56 3.3'-DICHLOROBENZIDINE	UG/L	10	U	10	U	10	U	10	U		
WS57 BENZO(A)ANTHRACENE	UG/L	10	U	10	U	10	U	10	U		
WS58 BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	10	U	10	U	10	U	10	U		
WS59 CHRYSENE	UG/L	10	U	10	U	10	U	10	U		
WS60 DI-N-OCTYL PHTHALATE	UG/L	10	U	10	U	10	U	10	U		
WS61 BENZO(B)FLUORANTHENE	UG/L	10	U	10	U	10	U	10	U		
WS62 BENZO(K)FLUORANTHENE	UG/L	10	U	10	U	10	U	10	U		
WS63 BENZO(A)PYRENE	UG/L	10	U	10	U	10	U	10	U		
WS64 INDENO(1.2.3-CD)PYRENE	UG/L	10	U	10	U	10	U	10	U		
WS65 DIBENZO(A,H)ANTHRACENE	UG/L	10	U	10	U	10	U	10	U		
WS66 BENZO(G,H,I)PERYLENE	UG/L	10	U	10	U	10	U	10	U		
WS67 CARBAZOLE	UG/L	10	U	10	U	10	U	10	U		
WT09 CYANIDE, TOTAL	MG/L	0.017	U	0.010	U	0.010	U	0.010	U		
WV03 CHLOROMETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV04 BROMOMETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV05 VINYL CHLORIDE	UG/L	10	U	10	U	10	U	10	U	10	U
WV06 CHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV07 METHYLENE CHLORIDE	UG/L	10	U	10	U	10	U	10	U	10	U
WV08 1.1-DICHLOROETHENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV09 1.1-DICHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV10 1.2-DICHLOROETHENE TOTAL	UG/L	10	U	10	U	10	U	10	U	10	U
WV11 CHLOROFORM	UG/L	10	U	10	U	10	U	10	U	10	U
WV12 1.2-DICHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV13 1.1.1-TRICHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV14 CARBON TETRACHLORIDE	UG/L	10	U	10	U	10	U	10	U	10	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	206		206D		207F		208F		209F	
WV15 BROMODICHLOROMETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV16 1,2-DICHLOROPROPANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV17 BENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV19 TRICHLOROETHENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV20 CIS-1,3-DICHLOROPROPENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV21 DIBROMOCHLOROMETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV22 1,1,2-TRICHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV24 BROMOFORM	UG/L	10	U	10	U	10	U	10	U	10	U
WV25 TETRACHLOROETHENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV26 TOLUENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV27 1,1,2,2-TETRACHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV28 CHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV29 ETHYL BENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV30 ACETONE	UG/L	10	U	10	U	10	U	10	U	10	U
WV31 CARBON DISULFIDE	UG/L	10	U	10	U	10	U	10	U	10	U
WV32 2-BUTANONE	UG/L	10	U	10	U	10	U	10	U	10	U
WV33 VINYL ACETATE	UG/L	10	U	10	U	10	U	10	U	10	U
WV34 2-HEXANONE	UG/L	10	U	10	U	10	U	10	U	10	U
WV35 4-METHYL-2-PENTANONE	UG/L	10	U	10	U	10	U	10	U	10	U
WV36 STYRENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV37 XYLENES, TOTAL	UG/L	10	U	10	U	10	U	10	U	10	U
WV40 TRANS-1,3-DICHLOROPROPENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV86 HYDROCARBONS, TOTAL PETROLEUM	MG/L					0.5	U				
ZZ01 SAMPLE NUMBER	NA	206		206		207		203		209	
ZZ02 ACTIVITY CODE	NA	DSX44		DSX44		DSX44		DSX44		DSX44	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	301	301D	302	303	304
WF01 WATER TEMP	'C	7.0	7.0	6.0	6.0	3.0
WF05 PH, FIELD	SU	8.15	8.15	7.87	7.27	7.05
WF10 CONDUCTIVITY (FIELD)	UMHOS	440	440	450	360	350
WM01 SILVER BY ICAP	UG/L	10 U	10 U	10 U	10 U	10 U
WM02 ALUMINUM BY ICAP	UG/L	5100 J	4800 J	5000 J	28000	10000 J
WM03 ARSENIC BY ICAP	UG/L	10 U	10 U	10 U	10 U	10 U
WM04 BARIUM BY ICAP	UG/L	200 U	200 U	200 U	280	200 U
WM05 BERYLLIUM BY ICAP	UG/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
WM06 CADMIUM BY ICAP	UG/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
WM07 COBALT BY ICAP	UG/L	50 U	50 U	50 U	50 U	50 U
WM08 CHROMIUM BY ICAP	UG/L	10 U	10 U	10 U	31 U	14
WM09 COPPER BY ICAP	UG/L	25 U	25 U	25 U	25 U	25 U
WM10 IRON BY ICAP	UG/L	5500	5300	5500	27000	11000
WM11 MANGANESE BY ICAP	UG/L	250	250	250	600	450
WM12 MOLYBDENUM BY ICAP	UG/L	NA O	NA O	NA O	NA O	NA O
WM13 NICKEL BY ICAP	UG/L	40 U	40 U	40 U	40 U	40 U
WM14 LEAD BY ICAP	UG/L	7.0	7.2	9.7	24 U	18
WM15 ANTIMONY BY ICAP	UG/L	60 U	60 U	60 U	60 U	60 U
WM16 SELENIUM BY ICAP	UG/L	5.0 U	5.0 U	5.0 U	NA I	5.0 U
WM17 THALLIUM BY ICAP	UG/L	NA O	NA O	NA O	NA O	NA O
WM18 TIN BY ICAP	UG/L	10 U	10 U	10 U	NA I	10 U
WM19 VANADIUM BY ICAP	UG/L	50 U	50 U	50 U	62	50 U
WM20 ZINC BY ICAP	UG/L	28 U	26 U	33 U	89 U	51
WM21 CALCIUM, TOTAL BY ICAP	MG/L	53	54	54	51 U	58
WM22 MAGNESIUM, TOTAL BY ICAP	MG/L	18	18	18	19 U	23
WM23 SODIUM, TOTAL BY ICAP	MG/L	36	36	36	30 U	19

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	301	301D	302	303	304
WM24 POTASSIUM, TOTAL BY ICAP	MG/L	6.2	6.1	6.2	8.8 U	5.2
WM35 SILVER,DISSOLVED BY ICAP	UG/L	10 U	10 U	10 U	10 U	10 U
WM36 ALUMINUM,DISSOLVED BY ICAP	UG/L	200 U	200 U	200 U	200 U	200 U
WM37 ARSENIC,DISSOLVED BY ICAP	UG/L	10 U	10 U	10 U	10 U	10 U
WM38 BARIUM,DISSOLVED BY ICAP	UG/L	200 U	200 U	200 U	200 U	200 U
WM39 BERYLLIUM,DISSOLVED BY ICAP	UG/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
WM40 CADMIUM,DISSOLVED BY ICAP	UG/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
WM41 COBALT,DISSOLVED BY ICAP	UG/L	50 U	50 U	50 U	50 U	50 U
WM42 CHROMIUM,DISSOLVED BY ICAP	UG/L	10 U	10 U	10 U	10 U	10 U
WM43 COPPER,DISSOLVED BY ICAP	UG/L	25 U	25 U	25 U	25 U	25 U
WM44 IRON,DISSOLVED BY ICAP	UG/L	100 U	100 U	100 U	100 U	100 U
WM45 MANGANESE,DISSOLVED BY ICAP	UG/L	17	15 U	15 U	15 U	15 U
WM46 MOLYBDENUM,DISSOLVED BY ICAP	UG/L	NA O	NA O	NA O	NA O	NA O
WM47 NICKEL,DISSOLVED BY ICAP	UG/L	40 U	40 U	40 U	40 U	40 U
WM48 LEAD,DISSOLVED BY ICAP	UG/L	3.0 U	3.3 J	3.0 U	3.0 U	3.0 U
WM49 ANTIMONY,DISSOLVED BY ICAP	UG/L	60 U	60 U	60 U	60 U	60 U
WM50 SELENIUM,DISSOLVED BY ICAP	UG/L	5.0 U	5.0 U	5.0 U	11 J	5.0 U
WM51 TITANIUM,DISSOLVED BY ICAP	UG/L	NA O	NA O	NA O	NA O	NA O
WM52 THALLIUM,DISSOLVED BY ICAP	UG/L	10 U	10 U	10 U	10 U	10 U
WM53 VANADIUM,DISSOLVED BY ICAP	UG/L	50 U	50 U	50 U	50 U	50 U
WM54 ZINC,DISSOLVED BY ICAP	UG/L	20 U	20 U	20 U	20 U	20 U
WM55 CALCIUM,DISSOLVED BY ICAP	MG/L	52	52	54	46	53
WM56 MAGNESIUM,DISSOLVED BY ICAP	MG/L	17	17	18	15	20
WM57 SODIUM,DISSOLVED BY ICAP	MG/L	36	37	38	30	19
WM58 POTASSIUM,DISSOLVED BY ICAP	MG/L	5.3	5.2	5.4	5.2	5.0 U
WS01 PHENOL	UG/L	10 U	10 U	10 U	10 U	10 U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	301		301D		302		303		304	
WS03 BIS(2-CHLOROETHYL) ETHER	UG/L	10	U	10	U	10	U	10	U	10	U
WS04 2-CHLOROPHENOL	UG/L	10	U	10	U	10	U	10	U	10	U
WS05 1,3-DICHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS06 1,4-DICHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS07 BENZYL ALCOHOL	UG/L	10	U	10	U	10	U	10	U	10	U
WS08 1,2-DICHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS09 2-METHYLPHENOL (O-CRESOL)	UG/L	10	U	10	U	10	U	10	U	10	U
WS10 BIS(2-CHLOROISOPROPYL) ETHER	UG/L	10	U	10	U	10	U	10	U	10	U
WS11 4-METHYLPHENOL (P-CRESOL)	UG/L	10	U	10	U	10	U	10	U	10	U
WS12 N-NITROSO-DIPROPYLAMINE	UG/L	10	U	10	U	10	U	10	U	10	U
WS13 HEXACHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WS14 NITROBENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS15 ISOPHORONE	UG/L	10	U	10	U	10	U	10	U	10	U
WS16 2-NITROPHENOL	UG/L	10	U	10	U	10	U	10	U	10	U
WS17 2,4-DIMETHYLPHENOL	UG/L	10	U	10	U	10	U	10	U	10	U
WS18 BENZOIC ACID	UG/L	50	U	50	U	50	U	50	U	50	U
WS19 BIS(2-CHLOROETHYOXY) METHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WS20 2,4-DICHLOROPHENOL	UG/L	10	U	10	U	10	U	10	U	10	U
WS21 1,2,4-TRICHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS22 NAPHTHALENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS23 4-CHLOROANILINE	UG/L	10	U	10	U	10	U	10	U	10	U
WS24 HEXACHLOROBUTADIENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS25 4-CHLORO-3-METHYLPHENOL	UG/L	10	U	10	U	10	U	10	U	10	U
WS26 2-METHYLNAPHTHALENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS27 HEXACHLOROCYCLOPENTADIENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS28 2,4,6-TRICHLOROPHENOL	UG/L	10	U	10	U	10	U	10	U	10	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	301	301D	302	303	304
WS29 2.4.5-TRICHLOROPHENOL	UG/L	25 U	25 U	25 U	25 U	25 U
WS30 2-CHLORONAPHTHALENE	UG/L	10 U	10 U	10 U	10 U	10 U
WS31 2-NITROANILINE (ORTHO NITROANILINE)	UG/L	25 U	25 U	25 U	25 U	25 U
WS32 DIMETHYLPHTHALATE	UG/L	10 U	10 U	10 U	10 U	10 U
WS33 ACENAPHTHYLENE	UG/L	10 U	10 U	10 U	10 U	10 U
WS34 3-NITROANILINE	UG/L	25 U	25 U	25 U	25 U	25 U
WS35 ACENAPHTHENE	UG/L	10 U	10 U	10 U	10 U	10 U
WS36 2.4-DINITROPHENOL	UG/L	25 U	25 U	25 U	25 U	25 U
WS37 4-NITROPHENOL	UG/L	25 U	25 U	25 U	25 U	25 U
WS38 DIBENZOFURAN	UG/L	10 U	10 U	10 U	10 U	10 U
WS39 2.4-DINITROTOLUENE	UG/L	10 U	10 U	10 U	10 U	10 U
WS40 2.6-DINITROTOLUENE	UG/L	10 U	10 U	10 U	10 U	10 U
WS41 DIETHYLPHTHALATE	UG/L	10 U	10 U	10 U	10 U	10 U
WS42 4-CHLOROPHENYL PHENYL ETHER	UG/L	10 U	10 U	10 U	10 U	10 U
WS43 FLUORENE	UG/L	10 U	10 U	10 U	10 U	10 U
WS44 4-NITROANILINE	UG/L	25 U	25 U	25 U	25 U	25 U
WS45 4.6-DINITRO-2-METHYLPHENOL	UG/L	25 U	25 U	25 U	25 U	25 U
WS46 N-NITROSODIPHENYLAMINE	UG/L	10 U	10 U	10 U	10 U	10 U
WS47 4-BROMOPHENYL PHENYL ETHER	UG/L	10 U	10 U	10 U	10 U	10 U
WS48 HEXACHLOROBENZENE	UG/L	10 U	10 U	10 U	10 U	10 U
WS49 PENTACHLOROPHENOL	UG/L	25 U	25 U	25 U	25 U	25 U
WS50 PHENANTHRENE	UG/L	10 U	10 U	10 U	10 U	10 U
WS51 ANTHRACENE	UG/L	10 U	10 U	10 U	10 U	10 U
WS52 DI-N-BUTYL PHTHALATE	UG/L	10 U	10 U	10 U	10 U	10 U
WS53 FLUORANTHENE	UG/L	10 U	10 U	10 U	10 U	10 U
WS54 PYRENE	UG/L	10 U	10 U	10 U	10 U	10 U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	301		301D		302		303		304	
WS55 BUTYL BENZYL PHTHALATE	UG/L	10	U	10	U	10	U	10	U	10	U
WS56 3,3'-DICHLOROBENZIDINE	UG/L	10	U	10	U	10	U	10	U	10	U
WS57 BENZO(A)ANTHRACENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS58 BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	10	U	10	U	10	U	10	U	10	U
WS59 CHRYSENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS60 DI-N-OCTYL PHTHALATE	UG/L	10	U	10	U	10	U	10	U	10	U
WS61 BENZO(B)FLUORANTHENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS62 BENZO(K)FLUORANTHENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS63 BENZO(A)PYRENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS64 INDENO(1,2,3-CD)PYRENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS65 DIBENZO(A,H)ANTHRACENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS66 BENZO(G,H,I)PERYLENE	UG/L	10	U	10	U	10	U	10	U	10	U
WS67 CARBAZOLE	UG/L	10	U	10	U	10	U	10	U	10	U
WT09 CYANIDE, TOTAL	MG/L	0.010	U	0.010	U	0.010	U	0.010	U	0.010	U
WV03 CHLOROMETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV04 BROMOMETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV05 VINYL CHLORIDE	UG/L	10	U	10	U	10	U	10	U	10	U
WV06 CHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV07 METHYLENE CHLORIDE	UG/L	10	U	10	U	10	U	10	U	10	U
WV08 1,1-DICHLOROETHENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV09 1,1-DICHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV10 1,2-DICHLOROETHENE, TOTAL	UG/L	10	U	10	U	10	U	10	U	10	U
WV11 CHLOROFORM	UG/L	10	U	10	U	10	U	10	U	10	U
WV12 1,2-DICHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV13 1,1,1-TRICHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV14 CARBON TETRACHLORIDE	UG/L	10	U	10	U	10	U	10	U	10	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	301		301D		302		303		304	
WV15 BROMODICHLOROMETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV16 1,2-DICHLOROPROPANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV17 BENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV19 TRICHLOROETHENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV20 CIS-1,3-DICHLOROPROPENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV21 DIBROMOCHLOROMETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV22 1,1,2-TRICHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV24 BROMOFORM	UG/L	10	U	10	U	10	U	10	U	10	U
WV25 TETRACHLOROETHENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV26 TOLUENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV27 1,1,2,2-TETRACHLOROETHANE	UG/L	10	U	10	U	10	U	10	U	10	U
WV28 CHLOROBENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV29 ETHYL BENZENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV30 ACETONE	UG/L	10	U	11	U	10	U	10	U	10	U
WV31 CARBON DISULFIDE	UG/L	10	U	10	U	10	U	10	U	10	U
WV32 2-BUTANONE	UG/L	10	U	10	U	10	U	10	U	10	U
WV33 VINYL ACETATE	UG/L	10	U	10	U	10	U	10	U	10	U
WV34 2-HEXANONE	UG/L	10	U	10	U	10	U	10	U	10	U
WV35 4-METHYL-2-PENTANONE	UG/L	10	U	10	U	10	U	10	U	10	U
WV36 STYRENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV37 XYLENES, TOTAL	UG/L	10	U	10	U	10	U	10	U	10	U
WV40 TRANS-1,3-DICHLOROPROPENE	UG/L	10	U	10	U	10	U	10	U	10	U
WV86 HYDROCARBONS, TOTAL PETROLEUM	MG/L	NA	O	0.5	U	0.5	U	0.5	U	0.5	U
Z201 SAMPLE NUMBER	NA	301		301		302		303		304	
Z702 ACTIVITY CODE	NA	DSX44		DSX44		DSX44		DSX44		DSX44	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

	COMPOUND	UNITS	304D	401		401D		402		403	
SM01	SILVER BY ICAP	MG/KG		2.6	U	2.6	U	2.6	U	2.6	U
SM02	ALUMINUM BY ICAP	MG/KG		5500		6800		12000		10000	
SM03	ARSENIC BY ICAP	MG/KG		3.7		4.0		8.4		7.1	
SM04	BARIUM BY ICAP	MG/KG		140		140		160		160	
SM05	BERYLLIUM BY ICAP	MG/KG		1.3	U	1.3	U	1.3	U	1.3	U
SM06	CADMIUM BY ICAP	MG/KG		1.3	U	1.3	U	1.3	U	1.3	U
SM07	COBALT BY ICAP	MG/KG		13	U	13	U	13	U	13	U
SM08	CHROMIUM BY ICAP	MG/KG		8.7		9.0		16		12	
SM09	COPPER BY ICAP	MG/KG		9.1		8.2		26		23	
SM10	IRON BY ICAP	MG/KG		9800		10000		19000		14000	
SM11	MANGANESE BY ICAP	MG/KG		250		300		320		250	J
SM12	MOLYBDENUM BY ICAP	MG/KG		NA	O	NA	O	NA	O	NA	O
SM13	NICKEL BY ICAP	MG/KG		10		11		18		16	
SM14	LEAD BY ICAP	MG/KG		30	J	13	J	36	J	31	J
SM15	ANTIMONY BY ICAP	MG/KG		15	U	15	U	16	U	16	U
SM16	SELENIUM BY ICAP	MG/KG		1.3	U	1.3	U	2.0	J	1.3	U
SM17	TITANIUM BY ICAP	MG/KG		NA	O	NA	O	NA	O	NA	O
SM18	THALLIUM BY ICAP	MG/KG		2.6	U	2.6	U	2.6	U	2.6	U
SM19	VANADIUM BY ICAP	MG/KG		15		17		27		25	
SM20	ZINC BY ICAP	MG/KG		35	J	36	J	77	J	64	
SM21	CALCIUM BY ICAP	MG/KG		6400		6300		6500		5700	
SM22	MAGNESIUM BY ICAP	MG/KG		2700		2900		3000		3600	
SM23	SODIUM BY ICAP	MG/KG		1300	U	1300	U	1300	U	1300	U
SM24	POTASSIUM BY ICAP	MG/KG		1300	U	1300	U	1700		1600	
SS01	PHENOL	UG/KG		420	U	410	U	820	U	1800	U
SS02	CARBAZOLE	UG/KG		420	U	410	U	820	U	1800	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	304D	401		401D		402		403	
SS03 BIS(2-CHLOROETHYL) ETHER	UG/KG		420	U	410	U	820	U	1800	U
SS04 2-CHLOROPHENOL	UG/KG		420	U	410	U	820	U	1800	U
SS05 1,3-DICHLOROBENZENE	UG/KG		420	U	410	U	820	U	1800	U
SS06 1,4-DICHLOROBENZENE	UG/KG		420	U	410	U	820	U	1800	U
SS07 BENZYL ALCOHOL	UG/KG		NA	O	NA	O	NA	O	NA	O
SS08 1,2-DICHLOROBENZENE	UG/KG		420	U	410	U	820	U	1800	U
SS09 2-METHYLPHENOL (O-CRESOL)	UG/KG		420	U	410	U	820	U	1800	U
SS10 BIS(2-CHLOROISOPROPYL) ETHER	UG/KG		420	U	410	U	820	U	1800	U
SS11 4-METHYLPHENOL (P-CRESOL)	UG/KG		420	U	410	U	820	U	1800	U
SS12 N-NITROSO-DIPROPYLAMINE	UG/KG		420	U	410	U	820	U	1800	U
SS13 HEXACHLOROETHANE	UG/KG		420	U	410	U	820	U	1800	U
SS14 NITROBENZENE	UG/KG		420	U	410	U	820	U	1800	U
SS15 ISOPHORONE	UG/KG		420	U	410	U	820	U	1800	U
SS16 2-NITROPHENOL	UG/KG		420	U	410	U	820	U	1800	U
SS17 2,4-DIMETHYLPHENOL	UG/KG		420	U	410	U	820	U	1800	U
SS18 BENZOIC ACID	UG/KG		NA	O	NA	O	NA	O	NA	O
SS19 BIS(2-CHLOROETHYOXY) METHANE	UG/KG		420	U	410	U	820	U	1800	U
SS20 2,4-DICHLOROPHENOL	UG/KG		420	U	410	U	820	U	1800	U
SS21 1,2,4-TRICHLOROBENZENE	UG/KG		420	U	410	U	820	U	1800	U
SS22 NAPHTHALENE	UG/KG		420	U	410	U	820	U	1800	U
SS23 4-CHLOROANILINE	UG/KG		420	U	410	U	820	U	1800	U
SS24 HEXACHLOROBUTADIENE	UG/KG		420	U	410	U	820	U	1800	U
SS25 4-CHLORO-3-METHYLPHENOL	UG/KG		420	U	410	U	820	U	1800	U
SS26 2-METHYLNAPHTHALENE	UG/KG		420	U	410	U	820	U	1800	U
SS27 HEXACHLOROCYCLOPENTADIENE	UG/KG		420	U	410	U	820	U	1800	U
SS28 2,4,6-TRICHLOROPHENOL	UG/KG		420	U	410	U	820	U	1800	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	304D	401		401D		402		403	
SS29 2,4,5-TRICHLOROPHENOL	UG/KG		1000	U	990	U	2000	U	4300	U
SS30 2-CHLORONAPHTHALENE	UG/KG		420	U	410	U	820	U	1800	U
SS31 2-NITROANILINE	UG/KG		1000	U	990	U	2000	U	4300	U
SS32 DIMETHYLPHTHALATE	UG/KG		420	U	410	U	820	U	1800	U
SS33 ACENAPHTHYLENE	UG/KG		420	U	410	U	820	U	1800	U
SS34 3-NITROANILINE	UG/KG		1000	U	990	U	2000	U	4300	U
SS35 ACENAPHTHENE	UG/KG		420	U	410	U	820	U	1800	U
SS36 2,4-DINITROPHENOL	UG/KG		1000	U	990	U	2000	U	4300	U
SS37 4-NITROPHENOL	UG/KG		1000	U	990	U	2000	U	4300	U
SS38 DIBENZOFURAN	UG/KG		420	U	410	U	820	U	1800	U
SS39 2,4-DINITROTOLUENE	UG/KG		420	U	410	U	820	U	1800	U
SS40 2,6-DINITROTOLUENE	UG/KG		420	U	410	U	820	U	1800	U
SS41 DIETHYLPHTHALATE	UG/KG		420	U	410	U	820	U	1800	U
SS42 4-CHLOROPHENYL PHENYL ETHER	UG/KG		420	U	410	U	820	U	1800	U
SS43 FLUORENE	UG/KG		420	U	410	U	820	U	1800	U
SS44 4-NITROANILINE	UG/KG		1000	U	990	U	2000	U	4300	U
SS45 4,6-DINITRO-2-METHYLPHENOL	UG/KG		1000	U	990	U	2000	U	4300	U
SS46 N-NITROSODIPHENYLAMINE	UG/KG		420	U	410	U	820	U	1800	U
SS47 4-BROMOPHENYL PHENYL ETHER	UG/KG		420	U	410	U	820	U	1800	U
SS48 HEXACHLOROBENZENE	UG/KG		420	U	410	U	820	U	1800	U
SS49 PENTACHLOROPHENOL	UG/KG		1000	U	990	U	2000	U	4300	U
SS50 PHENANTHRENE	UG/KG		420	U	410	U	2900		4400	
SS51 ANTHRACENE	UG/KG		420	U	410	U	820	U	1800	U
SS52 DI-N-BUTYL PHTHALATE	UG/KG		420	U	410	U	820	U	1300	U
SS53 FLUORANTHENE	UG/KG		420	U	750		5000		5100	
SS54 PYRENE	UG/KG		420	U	860		6400	J	6000	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	304D	401	401D	402	403
SS55 BUTYL BENZYL PHTHALATE	UG/KG		420 U	410 U	820 U	1800 U
SS56 3,3'-DICHLOROBENZIDINE	UG/KG		420 U	410 U	820 U	1800 U
SS57 BENZO(A)ANTHRACENE	UG/KG		420 U	60	3500	4200
SS58 BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG		420 U	410 U	820 U	1800 U
SS59 CHRYSENE	UG/KG		420 U	70	3900	4900
SS60 DI-N-OCTYL PHTHALATE	UG/KG		420 U	410 U	820 U	1800 U
SS61 BENZO(B)FLUORANTHENE	UG/KG		420 U	410 U	3600	3600
SS62 BENZO(K)FLUORANTHENE	UG/KG		420 U	410 U	1900	3100
SS63 BENZO(A)PYRENE	UG/KG		420 U	130	2600	5600
SS64 INDENO(1,2,3-CD)PYRENE	UG/KG		420 U	410 U	3000	2900
SS65 DIBENZO(A,H)ANTHRACENE	UG/KG		420 U	410 U	820 U	1800 U
SS66 BENZO(G,H,I)PERYLENE	UG/KG		420 U	410 U	1500	4100
ST09 CYANIDE	MG/KG		6.4 U	6.4 U	6	6.5 U
SV03 CHLOROMETHANE	UG/KG		13 U	13 U	13 U	14 U
SV04 BROMOMETHANE	UG/KG		13 U	13 U	13 U	14 U
SV05 VINYL CHLORIDE	UG/KG		13 U	13 U	13 U	14 U
SV06 CHLOROETHANE	UG/KG		13 U	13 U	13 U	14 U
SV07 METHYLENE CHLORIDE	UG/KG		13 U	15 U	13 U	14 U
SV08 1,1-DICHLOROETHYLENE	UG/KG		13 U	13 U	13 U	14 U
SV09 1,1-DICHLOROETHANE	UG/KG		13 U	13 U	13 U	14 U
SV10 TRANS-1,2-DICHLOROETHYLENE	UG/KG		13 U	13 U	13 U	14 U
SV11 CHLOROFORM	UG/KG		13 U	13 U	13 U	14 U
SV12 1,2-DICHLOROETHANE	UG/KG		13 U	13 U	13 U	14 U
SV13 1,1,1-TRICHLOROETHANE	UG/KG		13 U	13 U	13 U	14 U
SV14 CARBON TETRACHLORIDE	UG/KG		13 U	13 U	13 U	14 U
SV15 BROMODICHLOROMETHANE	UG/KG		13 U	13 U	13 U	14 U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	304D	401	401D	402	403
SV16 1,2-DICHLOROPROPANE	UG/KG		13 U	13 U	13 U	14 U
SV17 BENZENE	UG/KG		13 U	13 U	13 U	14 U
SV18 TRANS-1,3-DICHLOROPROPENE	UG/KG		13 U	13 U	13 U	14 U
SV19 TRICHLOROETHYLENE	UG/KG		13 U	13 U	13 U	14 U
SV20 CIS-1,3-DICHLOROPROPENE	UG/KG		13 U	13 U	13 U	14 U
SV21 DIBROMOCHLOROMETHANE	UG/KG		13 U	13 U	13 U	14 U
SV22 1,1,2-TRICHLOROETHANE	UG/KG		13 U	13 U	13 U	14 U
SV24 BROMOFORM	UG/KG		13 U	13 U	13 U	14 U
SV25 1,1,2,2-TETRACHLOROETHENE	UG/KG		13 U	13 U	13 U	14 U
SV26 TOLUENE	UG/KG		13 U	13 U	13 U	14 U
SV27 1,1,2,2-TETRACHLOROETHANE	UG/KG		13 U	13 U	13 U	14 U
SV28 CHLOROBENZENE	UG/KG		13 U	13 U	13 U	14 U
SV29 ETHYL BENZENE	UG/KG		13 U	13 U	13 U	14 U
SV30 ACETONE	UG/KG		13 U	26 U	24 U	30 U
SV31 CARBON DISULFIDE	UG/KG		13 U	13 U	13 U	14 U
SV32 2-BUTANONE	UG/KG		13 U	13 U	13 U	14 U
SV33 VINYL ACETATE	UG/KG		NA O	NA O	NA O	NA O
SV34 2-HEXANONE	UG/KG		13 U	13 U	13 U	14 U
SV35 4-METHYL-2-PENTANONE	UG/KG		13 U	13 U	13 U	14 U
SV36 STYRENE	UG/KG		13 U	13 U	13 U	14 U
SV37 XYLENES, TOTAL	UG/KG		13 U	13 U	13 U	14 U
SV54 HYDROCARBONS, TOTAL PETROLEUM	MG/KG		31	31 U	82	49
WT01 WATER TEMP	°C	3.0				
WT05 PH, FIELD	SU	7.05				
WT10 CONDUCTIVITY (FIELD)	UMHOS	350				
WM01 SILVER BY ICAP	UG/L	10 U				

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND		UNITS	304D		401	401D	402	403
WM02 ALUMINUM	BY ICAP	UG/L	9700	J				
WM03 ARSENIC	BY ICAP	UG/L	10	U				
WM04 BARIUM	BY ICAP	UG/L	200	U				
WM05 BERYLLIUM	BY ICAP	UG/L	5.0	U				
WM06 CADMIUM	BY ICAP	UG/L	5.0	U				
WM07 COBALT	BY ICAP	UG/L	50	U				
WM08 CHROMIUM	BY ICAP	UG/L	12					
WM09 COPPER	BY ICAP	UG/L	25	U				
WM10 IRON	BY ICAP	UG/L	11000					
WM11 MANGANESE	BY ICAP	UG/L	430					
WM12 MOLYBDENUM	BY ICAP	UG/L	NA	O				
WM13 NICKEL	BY ICAP	UG/L	40	U				
WM14 LEAD	BY ICAP	UG/L	15					
WM15 ANTIMONY	BY ICAP	UG/L	60	U				
WM16 SELENIUM	BY ICAP	UG/L	5 0	U				
WM17 TITANIUM	BY ICAP	UG/L	NA	O				
WM18 THALLIUM	BY ICAP	UG/L	10	U				
WM19 VANADIUM	BY ICAP	UG/L	50	U				
WM20 ZINC	BY ICAP	UG/L	46					
WM21 CALCIUM, TOTAL	BY ICAP	MG/L	57					
WM22 MAGNESIUM, TOTAL	BY ICAP	MG/L	22					
WM23 SODIUM, TOTAL	BY ICAP	MG/L	19					
WM24 POTASSIUM, TOTAL	BY ICAP	MG/L	5.1					
WM35 SILVER,DISSOLVED	BY ICAP	UG/L	10	U				
WM36 ALUMINUM,DISSOLVED	BY ICAP	UG/L	200	U				
WM37 ARSENIC,DISSOLVED	BY ICAP	UG/L	10	U				

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	304D		401	401D	402	403
WM38 BARIUM,DISSOLVED BY ICAP	UG/L	200	U				
WM39 BERYLLIUM,DISSOLVED BY ICAP	UG/L	5.0	U				
WM40 CADMIUM,DISSOLVED BY ICAP	UG/L	5.0	U				
WM41 COBALT,DISSOLVED BY ICAP	UG/L	50	U				
WM42 CHROMIUM,DISSOLVED BY ICAP	UG/L	10	U				
WM43 COPPER,DISSOLVED BY ICAP	UG/L	25	U				
WM44 IRON,DISSOLVED BY ICAP	UG/L	100	U				
WM45 MANGANESE,DISSOLVED BY ICAP	UG/L	15	U				
WM46 MOLYBDENUM,DISSOLVED BY ICAP	UG/L	NA	O				
WM47 NICKEL,DISSOLVED BY ICAP	UG/L	40	U				
WM48 LEAD,DISSOLVED BY ICAP	UG/L	3.0	U				
WM49 ANTIMONY,DISSOLVED BY ICAP	UG/L	60	U				
WM50 SELENIUM,DISSOLVED BY ICAP	UG/L	5.0	U				
WM51 TITANIUM,DISSOLVED BY ICAP	UG/L	NA	O				
WM52 THALLIUM,DISSOLVED BY ICAP	UG/L	10	U				
WM53 VANADIUM,DISSOLVED BY ICAP	UG/L	50	U				
WM54 ZINC,DISSOLVED BY ICAP	UG/L	20	U				
WM55 CALCIUM,DISSOLVED BY ICAP	MG/L	55					
WM56 MAGNESIUM,DISSOLVED BY ICAP	MG/L	21					
WM57 SODIUM,DISSOLVED BY ICAP	MG/L	20					
WM58 POTASSIUM,DISSOLVED BY ICAP	MG/L	5.0	U				
WM61 PHENOL	UG/L	10	U				
WM63 BIS(2 CHLOROETHYL) ETHER	UG/L	10	U				
WM64 2 CHLOROPHENOL	UG/L	10	U				
WM65 1,3 DICHLOROBENZENE	UG/L	10	U				
WM66 1,4 DICHLOROBENZENE	UG/L	10	U				

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	304D		401	401D	402	403
WS07 BENZYL ALCOHOL	UG/L	10	U				
WS08 1,2-DICHLOROBENZENE	UG/L	10	U				
WS09 2-METHYLPHENOL (O-CRESOL)	UG/L	10	U				
WS10 BIS(2-CHLOROISOPROPYL) ETHER	UG/L	10	U				
WS11 4-METHYLPHENOL (P-CRESOL)	UG/L	10	U				
WS12 N-NITROSO-DIPROPYLAMINE	UG/L	10	U				
WS13 HEXACHLOROETHANE	UG/L	10	U				
WS14 NITROBENZENE	UG/L	10	U				
WS15 ISOPHORONE	UG/L	10	U				
WS16 2-NITROPHENOL	UG/L	10	U				
WS17 2,4-DIMETHYLPHENOL	UG/L	10	U				
WS18 BENZOIC ACID	UG/L	50	U				
WS19 BIS(2-CHLOROETHYOXY) METHANE	UG/L	10	U				
WS20 2,4-DICHLOROPHENOL	UG/L	10	U				
WS21 1,2,4-TRICHLOROBENZENE	UG/L	10	U				
WS22 NAPHTHALENE	UG/L	10	U				
WS23 4-CHLOROANILINE	UG/L	10	U				
WS24 HEXACHLOROBUTADIENE	UG/L	10	U				
WS25 4-CHLORO-3-METHYLPHENOL	UG/L	10	U				
WS26 2-METHYLNAPHTHALENE	UG/L	10	U				
WS27 HEXACHLOROCYCLOPENTADIENE	UG/L	10	U				
WS28 2,4,6-TRICHLOROPHENOL	UG/L	10	U				
WS29 2,4,5-TRICHLOROPHENOL	UG/L	25	U				
WS30 2-CHLORONAPHTHALENE	UG/L	10	U				
WS31 2-NITROANILINE (ORTHO NITROANILINE)	UG/L	25	U				
WS32 DIMETHYLPHTHALATE	UG/L	10	U				

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	304D		401	401D	402	403
WS33 ACENAPHTHYLENE	UG/L	10	U				
WS34 3-NITROANILINE	UG/L	25	U				
WS35 ACENAPHTHENE	UG/L	10	U				
WS36 2,4-DINITROPHENOL	UG/L	25	U				
WS37 4-NITROPHENOL	UG/L	25	U				
WS38 DIBENZOFURAN	UG/L	10	U				
WS39 2,4-DINITROTOLUENE	UG/L	10	U				
WS40 2,6-DINITROTOLUENE	UG/L	10	U				
WS41 DIETHYLPHTHALATE	UG/L	10	U				
WS42 4-CHLOROPHENYL PHENYL ETHER	UG/L	10	U				
WS43 FLUORENE	UG/L	10	U				
WS44 4-NITROANILINE	UG/L	25	U				
WS45 4,6-DINITRO-2-METHYLPHENOL	UG/L	25	U				
WS46 N-NITROSODIPHENYLAMINE	UG/L	10	U				
WS47 4-BROMOPHENYL PHENYL ETHER	UG/L	10	U				
WS48 HEXACHLOROBENZENE	UG/L	10	U				
WS49 PENTACHLOROPHENOL	UG/L	25	U				
WS50 PHENANTHRENE	UG/L	10	U				
WS51 ANTHRACENE	UG/L	10	U				
WS52 DI-N-BUTYL PHTHALATE	UG/L	10	U				
WS53 FLUORANTHENE	UG/L	10	U				
WS54 PYRENE	UG/L	10	U				
WS55 BUTYL BENZYL PHTHALATE	UG/L	10	U				
WS56 3,3'-DICHLOROBENZIDINE	UG/L	10	U				
WS57 BENZO(A)ANTHRACENE	UG/L	10	U				
WS58 BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	10	U				

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	304D		401	401D	402	403
WS59 CHRYSENE	UG/L	10	U				
WS60 DI-N-OCTYL PHTHALATE	UG/L	10	U				
WS61 BENZO(B)FLUORANTHENE	UG/L	10	U				
WS62 BENZO(K)FLUORANTHENE	UG/L	10	U				
WS63 BENZO(A)PYRENE	UG/L	10	U				
WS64 INDENO(1,2,3-CD)PYRENE	UG/L	10	U				
WS65 DIBENZO(A,H)ANTHRACENE	UG/L	10	U				
WS66 BENZO(G,H,I)PERYLENE	UG/L	10	U				
WS67 CARBAZOLE	UG/L	10	U				
WT09 CYANIDE, TOTAL	MG/L	0.013	J				
WV03 CHLOROMETHANE	UG/L	10	U				
WV04 BROMOMETHANE	UG/L	10	U				
WV05 VINYL CHLORIDE	UG/L	10	U				
WV06 CHLOROETHANE	UG/L	10	U				
WV07 METHYLENE CHLORIDE	UG/L	10	U				
WV08 1,1-DICHLOROETHENE	UG/L	10	U				
WV09 1,1-DICHLOROETHANE	UG/L	10	U				
WV10 1,2-DICHLOROETHENE, TOTAL	UG/L	10	U				
WV11 CHLOROFORM	UG/L	10	U				
WV12 1,2-DICHLOROETHANE	UG/L	10	U				
WV13 1,1,1-TRICHLOROETHANE	UG/L	10	U				
WV14 CARBON TETRACHLORIDE	UG/L	10	U				
WV15 BROMODICHLOROMETHANE	UG/L	10	U				
WV16 1,2 DICHLOROPROPANE	UG/L	10	U				
WV17 BENZENE	UG/L	10	U				
WV19 TRICHLOROETHENE	UG/L	10	U				

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	304D		401	401D	402	403
WV20 CIS-1.3-DICHLOROPROPENE	UG/L	10	U				
WV21 DIBROMOCHLOROMETHANE	UG/L	10	U				
WV22 1.1.2-TRICHLOROETHANE	UG/L	10	U				
WV24 BROMOFORM	UG/L	10	U				
WV25 TETRACHLOROETHENE	UG/L	10	U				
WV26 TOLUENE	UG/L	10	U				
WV27 1.1.2.2-TETRACHLOROETHANE	UG/L	10	U				
WV28 CHLOROBENZENE	UG/L	10	U				
WV29 ETHYL BENZENE	UG/L	10	U				
WV30 ACETONE	UG/L	10	U				
WV31 CARBON DISULFIDE	UG/L	10	U				
WV32 2-BUTANONE	UG/L	10	U				
WV33 VINYL ACETATE	UG/L	10	U				
WV34 2-HEXANONE	UG/L	10	U				
WV35 4-METHYL-2-PENTANONE	UG/L	10	U				
WV36 STYRENE	UG/L	10	U				
WV37 XYLENES, TOTAL	UG/L	10	U				
WV40 TRANS-1.3-DICHLOROPROPENE	UG/L	10	U				
WV86 HYDROCARBONS, TOTAL PETROLEUM	MG/L	0.5	U				
Z701 SAMPLE NUMBER	NA	304		401	401	402	403
Z702 ACTIVITY CODE	NA	DSX44		DSX44	DSX44	DSX44	DSX44

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	501					
SS01 PHENOL	UG/KG	450000	U				
SS03 BIS(2-CHLOROETHYL) ETHER	UG/KG	450000	U				
SS04 2-CHLOROPHENOL	UG/KG	450000	U				
SS05 1,3-DICHLOROBENZENE	UG/KG	450000	U				
SS06 1,4-DICHLOROBENZENE	UG/KG	450000	U				
SS07 BENZYL ALCOHOL	UG/KG	450000	U				
SS08 1,2-DICHLOROBENZENE	UG/KG	450000	U				
SS09 2-METHYLPHENOL (O-CRESOL)	UG/KG	450000	U				
SS10 BIS(2-CHLOROISOPROPYL) ETHER	UG/KG	450000	U				
SS11 4-METHYLPHENOL (P-CRESOL)	UG/KG	450000	U				
SS12 N-NITROSO-DIPROPYLAMINE	UG/KG	450000	U				
SS13 HEXACHLOROETHANE	UG/KG	450000	U				
SS14 NITROBENZENE	UG/KG	450000	U				
SS15 ISOPHORONE	UG/KG	450000	U				
SS16 2-NITROPHENOL	UG/KG	450000	U				
SS17 2,4-DIMETHYLPHENOL	UG/KG	450000	U				
SS18 BENZOIC ACID	UG/KG	2300000	U				
SS19 BIS(2-CHLOROETHYOXY) METHANE	UG/KG	450000	U				
SS20 2,4-DICHLOROPHENOL	UG/KG	450000	U				
SS21 1,2,4-TRICHLOROBENZENE	UG/KG	450000	U				
SS22 NAPHTHALENE	UG/KG	1000000					
SS23 4-CHLOROANILINE	UG/KG	450000	U				
SS24 HEXACHLOROBUTADIENE	UG/KG	450000	U				
SS25 4-CHLORO-3-METHYLPHENOL	UG/KG	450000	U				
SS26 2-METHYLNAPHTHALENE	UG/KG	1000000					
SS27 HEXACHLOROCYCLOPENTADIENE	UG/KG	450000	U				

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	501					
SS28 2,4,6-TRICHLOROPHENOL	UG/KG	450000	U				
SS29 2,4,5-TRICHLOROPHENOL	UG/KG	2300000	U				
SS30 2-CHLORONAPHTHALENE	UG/KG	450000	U				
SS31 2-NITROANILINE	UG/KG	2300000	U				
SS32 DIMETHYLPHTHALATE	UG/KG	450000	U				
SS33 ACENAPHTHYLENE	UG/KG	450000	U				
SS34 3-NITROANILINE	UG/KG	2300000	U				
SS35 ACENAPHTHENE	UG/KG	620000	[redacted]				
SS36 2,4-DINITROPHENOL	UG/KG	2300000	U				
SS37 4-NITROPHENOL	UG/KG	2300000	U				
SS38 DIBENZOFURAN	UG/KG	450000	U				
SS39 2,4-DINITROTOLUENE	UG/KG	450000	U				
SS40 2,6-DINITROTOLUENE	UG/KG	450000	U				
SS41 DIETHYLPHTHALATE	UG/KG	450000	U				
SS42 4-CHLOROPHENYL PHENYL ETHER	UG/KG	450000	U				
SS43 FLUORENE	UG/KG	[redacted]					
SS44 4-NITROANILINE	UG/KG	2300000	U				
SS45 4,6-DINITRO-2-METHYLPHENOL	UG/KG	2300000	U				
SS46 N-NITROSODIPHENYLAMINE	UG/KG	450000	U				
SS47 4-BROMOPHENYL PHENYL ETHER	UG/KG	450000	U				
SS48 HEXACHLOROBENZENE	UG/KG	450000	U				
SS49 PENTACHLOROPHENOL	UG/KG	2300000	U				
SS50 PHENANTHRENE	UG/KG	[redacted]					
SS51 ANTHRACENE	UG/KG	[redacted]					
SS52 DI-N-BUTYL PHTHALATE	UG/KG	450000	U				
SS53 FLUORANTHENE	UG/KG	[redacted]					

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	501					
SS54 PYRENE	UG/KG	2800000					
SS55 BUTYL BENZYL PHTHALATE	UG/KG	450000	U				
SS56 3,3'-DICHLOROBENZIDINE	UG/KG	900000	U				
SS57 BENZO(A)ANTHRACENE	UG/KG	1600000					
SS58 BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	450000	U				
SS59 CHRYSENE	UG/KG	2700000					
SS60 DI-N-OCTYL PHTHALATE	UG/KG	450000	U				
SS61 BENZO(B)FLUORANTHENE	UG/KG	450000	U				
SS62 BENZO(K)FLUORANTHENE	UG/KG	450000	U				
SS63 BENZO(A)PYRENE	UG/KG	970000					
SS64 INDENO(1,2,3-CD)PYRENE	UG/KG	450000	U				
SS65 DIBENZO(A,H)ANTHRACENE	UG/KG	450000	U				
SS66 BENZO(G,H,I)PERYLENE	UG/KG	450000	U				
SV03 CHLOROMETHANE	UG/KG	5000	U				
SV04 BROMOMETHANE	UG/KG	5000	U				
SV05 VINYL CHLORIDE	UG/KG	5000	U				
SV06 CHLOROETHANE	UG/KG	5000	U				
SV07 METHYLENE CHLORIDE	UG/KG	5000	U				
SV08 1,1-DICHLOROETHYLENE	UG/KG	2500	U				
SV09 1,1-DICHLOROETHANE	UG/KG	2500	U				
SV10 TRANS-1,2-DICHLOROETHYLENE	UG/KG	2500	U				
SV11 CHLOROFORM	UG/KG	2500	U				
SV12 1,2-DICHLOROETHANE	UG/KG	2500	U				
SV13 1,1,1-TRICHLOROETHANE	UG/KG	2500	U				
SV14 CARBON TETRACHLORIDE	UG/KG	2500	U				
SV15 BROMODICHLOROMETHANE	UG/KG	2500	U				

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 1-DSX44 VALIDATED DATA

COMPOUND	UNITS	501					
SV16 1.2-DICHLOROPROPANE	UG/KG	2500	U				
SV17 BENZENE	UG/KG	21000					
SV18 TRANS-1.3-DICHLOROPROPENE	UG/KG	2500	U				
SV19 TRICHLOROETHYLENE	UG/KG	2500	U				
SV20 CIS-1.3-DICHLOROPROPENE	UG/KG	2500	U				
SV21 DIBROMOCHLOROMETHANE	UG/KG	2500	U				
SV22 1.1.2-TRICHLOROETHANE	UG/KG	2500	U				
SV24 BROMOFORM	UG/KG	2500	U				
SV25 1.1.2.2-TETRACHLOROETHENE	UG/KG	2500	U				
SV26 TOLUENE	UG/KG	84000					
SV27 1.1.2.2-TETRACHLOROETHANE	UG/KG	2500	U				
SV28 CHLOROBENZENE	UG/KG	2500	U				
SV29 ETHYL BENZENE	UG/KG	38000					
SV30 ACETONE	UG/KG	5000	U				
SV31 CARBON DISULFIDE	UG/KG	2500	U				
SV32 2-BUTANONE	UG/KG	5000	U				
SV33 VINYL ACETATE	UG/KG	5000	U				
SV34 2-HEXANONE	UG/KG	5000	U				
SV35 4-METHYL-2-PENTANONE	UG/KG	5000	U				
SV36 STYRENE	UG/KG	2500	U				
SV37 XYLENES, TOTAL	UG/KG	196000					
SV54 HYDROCARBONS, TOTAL PETROLEUM	MG/KG	ATTACHMENT					
Z201 SAMPLE NUMBER	NA	501					
Z202 ACTIVITY CODE	NA	DSX44					

ACTIVITY DSX44 LACLEDE COAL GAS

THE PROJECT LEADER SHOULD CIRCLE ONE - STORET, AIRS, OR ARCHIVE.

CIRCLE ONE: STORET AIRS ARCHIVE

DATA APPROVED BY LABO FOR TRANSMISSION TO PROJECT LEADER ON 06/12/91 09:01:15 BY _____

ANALYSIS REQUEST REPORT VALIDATED DATA

FOR ACTIVITY: DSX44

S P F D 06/12/91 16:34:32

* FINAL REPORT

FY: 91 ACTIVITY: DSX44 DESCRIPTION: LACLEDE COAL GAS LOCATION: MISSOURI

STATUS: ACTIVE TYPE: SAMPLING - CONTRACT LAB ANALYSIS PROJECT: A34

LABO DUE DATE IS 5/14/91. REPORT DUE DATE IS 5/28/91.

INSPECTION DATE: 3/14/91 ALL SAMPLES RECEIVED DATE: 03/15/91

ALL DATA APPROVED BY LABO DATE: 06/12/91 FINAL REPORT TRANSMITTED DATE: 06/21/91

EXPECTED LABO TURNAROUND TIME IS 60 DAYS EXPECTED REPORT TURNAROUND TIME IS 75 DAYS

ACTUAL LABO TURNAROUND TIME IS 89 DAYS ACTUAL REPORT TURNAROUND TIME IS 99 DAYS

SAMP. NO.	QCC	M	DESCRIPTION	SAMPLE STATUS	# CONT.	CITY	STATE	AIRS/ STORET LOC NO	BEG. DATE	BEG. TIME	END. DATE	END. TIME
001		S	BACKGROUND SAMPLE-CSI-A	1	4	ST. LOUIS	MISSOURI		03/07/91	15:36	/ /	:
002		S	BACKGROUND SAMPLE-CSI-B	1	4	ST. LOUIS	MISSOURI		03/07/91	11:00	/ /	:
003		S	BACKGROUND SAMPLE-CSI-C	1	4	ST. LOUIS	MISSOURI		03/07/91	16:45	/ /	:
004		S	BACKGROUND SAMPLE-CSI-D	1	4	ST. LOUIS	MISSOURI		03/07/91	16:55	/ /	:
005		S	BACKGROUND SAMPLE-CSI-E	1	4	ST. LOUIS	MISSOURI		03/07/91	17:15	/ /	:
006		S	BORING LOCAL #6-B-06-CS2	1	4	ST. LOUIS	MISSOURI		03/08/91	09:20	/ /	:
007		S	BORING LOCAL #6-R-06-CS2	1	4	ST. LOUIS	MISSOURI		03/08/91	09:35	/ /	:
008		S	R-06-CS3 SAMPLE LOCATION	1	4	ST. LOUIS	MISSOURI		03/08/91	11:07	/ /	:
009		S	B-14-CS4 SAMPLE LOCATION	1	4	ST. LOUIS	MISSOURI		03/08/91	13:50	/ /	:
010		W	B14-CS4 SAMPLE LOCATION	1	4	ST. LOUIS	MISSOURI		03/08/91	14:20	/ /	:
011		S	B-07-CS6 SAMPLE LOCATION	1	4	ST. LOUIS	MISSOURI		03/08/91	17:35	/ /	:
012		S	R13-CS7 SAMPLE LOCATION	1	4	ST. LOUIS	MISSOURI		03/09/91	09:24	/ /	:
013		S	B13-CS7 SAMPLE LOCATION	1	4	ST. LOUIS	MISSOURI		03/09/91	09:45	/ /	:
101		S	BORING LOCATION-01/MOUND STR POWER	1	3	ST. LOUIS	MISSOURI		03/04/91	13:05	/ /	:
102		S	BORING LOCATION 02	1	3	ST. LOUIS	MISSOURI		03/02/91	14:20	/ /	:
103		S	SURFACE SOIL AT EAST CENTRALOF TANK	1	3	ST. LOUIS	MISSOURI		03/04/91	15:30	/ /	:
104		S	BORING LOCATION 05	1	3	ST. LOUIS	MISSOURI		03/04/91	17:25	/ /	:
105		S	BETWEEN TANKS 7-8/BORING 07	1	3	ST. LOUIS	MISSOURI		03/05/91	13:50	/ /	:
106		S	BORING LOCATION-15	1	3	ST. LOUIS	MISSOURI		03/06/91	14:10	/ /	:
107		S	BORING LOCATION -16	1	3	ST. LOUIS	MISSOURI		03/06/91	15:15	/ /	:
108		S	BORING LOCATION-17	1	3	ST. LOUIS	MISSOURI		03/06/91	15:45	/ /	:
109		S	BORING LOCATION-18	1	3	ST. LOUIS	MISSOURI		03/06/91	16:53	/ /	:
110		S	R19-SAMPLE LOCATION	1	3	ST. LOUIS	MISSOURI		03/14/91	07:45	/ /	:
111		S	R20-SAMPLE LOCATION	1	3	ST. LOUIS	MISSOURI		03/14/91	07:30	/ /	:
112		S	B21-SAMPLE LOCATION	1	3	ST. LOUIS	MISSOURI		03/13/91	17:30	/ /	:

APPENDIX E

Field Sheets
and
Chain of Custody Records

RAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

Y: 91 ACTNO: DSX44 SAMNO: 001 QCC: _ MEDIA: SOIL PL: S P F D

CTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
OCATION: St. Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

AMPLE DES: CS1-A DATE 07 TIME FROM REF PT
OCATION: ST. LOUIS MO BEG: 03/01/91 15:36 EAST: ____
ASE/BATCH/SMO: ____/__/____ LAB: ___ END: __/__/__ __:__ NORTH: ____
TORET/SAROAD NO: _____ DOWN: 2-7 ft.

NALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
~~GLASS~~	~~ICED~~	~~SS~~	~~SEMIVOLATILES~~ ~~dilute~~
GLASS	NONE	SV	-VOLATILES.
~~GLASS~~	~~ICED~~	~~SM~~	~~METALS~~ ~~dilute~~
~~GLASS~~	NONE	~~STO9~~	~~CYANIDE~~ ~~dilute~~
~~GLASS~~	~~ICED~~	SM34	MERCURY BY COLD VAP dilute.

OMMENTS: SEE Boring & Safety Log #1

BACKGROUND

Need dilution

AMPLE COLLECTED BY : PECK/McCALL

AFT FIELD SHEET
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: 91 ACTNO: DSX44 SAMNO: 002 QCC: _ MEDIA: SOIL PL: S P F D

TIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
CATION: St Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

MPLE DES: CS 1 - B DATE TIME FROM REF PT
CATION: ST. LOUIS MO BEG: 03/07/91 11:00 EAST: ___
SE/BATCH/SMO: _____/_/_____ LAB: ___ END: __/__/__ __:__ NORTH: ___
DRET/SAROAD NO: _____ DOWN: 2-11' ft

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MGP	NAME
ASS	ICED	SS	SEMIVOLATILES
ASS	NONE	SV	VOLATILES
~~ASS~~	~~ICED~~	~~SM~~	METALS
~~ASS~~	~~NONE~~	ST09	CYANIDE
~~ASS~~	~~ICED~~	~~SM34~~	~~MERCURY~~ BY COLD VAP

MMENTS: SEE ~~BORING~~ BORING & SAFETY LOG #2
BACKGROUND

[illegible]

MPLE COLLECTED BY : PECK/McCALL

:AFT FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII

ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

': 91 ACTNO: DSX44 SAMNO: 003 ICC: _ MEDIA: SOIL PL: S P F D

:TIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __

)CATION: St. Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

)MPLE DES: C51-C KB DATE TIME FROM REF PT

)CATION: ST. LOUIS MO BEG: 03/01/91 16:45 EAST: ____

\SE/BATCH/SMO: ____/_/____ LAB: ___ END: __/__/__ __:__ NORTH: ____

:ORET/SAROAD NO: _____ DOWN: 1-15'

)ALYSIS REQUESTED:

:NTAINER	PRESERVATIVE	MGP	NAME
.ASS	ICED	SS	SEMIVOLATILES
.ASS	NONE	SV	VOLATILES
:ASS	ICED	SM	METALS
.ASS	NONE	SIG9	CYANIDE
:ASS	ICED	SM34	MERCURY BY COLD VAP

)MMENTS:

SEE BORING + SAFETY LOG #2

Background

filed. Concentration

AMPLE COLLECTED BY : PECK/McCALL

RAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

Y: 91 ACTNO: DSX44 SAMNO: 004 QCC: _ MEDIA: SOIL PL: S P F D

CTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
OCATION: St. Louis MO PROJECT NUM: 434 PT: LONGITUDE: __ __ __

MPLE DES: ~~GS1~~ GS1-D
OCATION: ST. LOUIS MO
SE/BATCH/SMO: ____/_/____ LAB: ___
ORET/SAROAD NO: _____

DATE TIME FROM REF PT
BEG: 03/01/91 16:55 EAST: ____
END: __/__/__ __:__ NORTH: ____
DOWN: 12 feet

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MGP	NAME
ASS	~~ICED~~	SS	SEMIVOLATILES ~~dioxin~~
ASS	NONE	SV	VOLATILES
~~ASS~~	~~ICED~~	SM	~~METALS~~
~~ASS~~	NONE	ST09	~~CYANIDE~~ & ~~Phenols~~
~~ASS~~	ICED	SM34	~~MERCURY~~ BY COLD VAP

MMENTS: SEE BORING & SAFETY LOG #2
BACKGROUND

Need Concentration

MPLE COLLECTED BY : PELK / McCall

AFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: 91 ACTNO: 05X44 SAMNC: 005 ACC: _ MEDIA: SOIL PL: S P F D

TIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
CATION: St. Louis MO PROJECT NUM: 434 PT: LONGITUDE: __ __ __

MPLE DES: GS1-E DATE TIME FROM REF PT
CATION: ST. LOUIS MO BEG: 03/01/91 12:15 EAST: ____
SE/BATCH/SMO: ____/_/____ LAB: ___ END: __/__/__ __:__ NORTH: ____
ORET/SAROAD NO: _____ DOWN: 19.23ft

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MGP	NAME
ASS	ICED	SS	SEMIVOLATILES
ASS	NONE	SV	VOLATILES
ASS	ICED	SM	METALS
ASS	NONE	SI09	CYANIDE
ASS	ICED	SM34	MERCURY BY COLD VAP

MMENTS: See Boring + Safety Log #2
BACKGROUND

Mixed concentration

MPLE COLLECTED BY : PECK/McCALL

AFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: 91 ACTNO: OSX44 SAMNO: 006 QCC: _ MEDIA: SOIL PL: S P F D

TIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
CATION: ~~St. Louis~~ MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

MPLE DES: ~~Bore 45~~
CATION: ST. LOUIS MO BEG: ~~03/07~~/91 ~~07:20~~ DATE TIME FROM REF PT
SE/BATCH/SMO: ____/_/____ LAB: ___ END: __/__/__ __:__ EAST: ____
DRET/SAROAD NO: _____ NORTH: ____
DOWN: 7-9 ft

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MGP	NAME	
~~ASS~~	ICED	~~SS~~	SEMIVOLATILES	Metals
ASS	NONE	SV	VOLATILES	
~~ASS~~	ICED	SM	METALS	Metals
~~ASS~~	NONE	~~ST09~~	~~CYANIDE~~	
~~ASS~~	ICED	SM34	MERCURY	~~BY COLD VAP~~

NO Hg

MENTS:

Boring location #6 contains sample #2

See boring + soils log #2

VIB

Lead Contamination

MPLE COLLECTED BY : Rick Nicholl

AFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: 91 ACTNO: DSX44 SAMNO: 007 QCC: _ MEDIA: SOIL PL: S P F D

TIVITY DES: LACLEDE COAL GAS REF LATITUDE: _ _ _
CATION: _____ MO PROJECT NUM: A34 PT: LONGITUDE: _ _ _

MPLE DES: B-6 #2
CATION: ST. LOUIS MO
SE/BATCH/SMO: ____1_1_____ LAB: ___
ORET/SAROAD NO: _____

DATE TIME FROM REF PT
BEG: 03/01/91 12:15 EAST: ____
END: 03/01/91 __:__ NORTH: ____
DOWN: 8-13 ft

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MGP	NAME	
~~ASS~~	~~ICED~~	~~SS~~	~~SEMIVOLATILES~~	~~duplicate~~
ASS	NONE	SV	VOLATILES	
~~ASS~~	~~ICED~~	~~SM~~	~~METALS~~	~~duplicate~~
~~ASS~~	NONE	~~SM09~~	~~CYANIDE~~	
~~ASS~~	~~ICED~~	~~SM34~~	~~MERCURY BY COLD VAP~~	NO Hg.

MMENTS:

Boring location #6 continuous sample #2

See boring & soil log #2

V/B
Mid-Con.

MPLE COLLECTED BY : Jack Miller

AFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: 91 ACTNO: DSX44 SAMNO: 008 OCC: _ MEDIA: SOIL PL: S P F D

TIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
ICATION: _____ MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

MPLE DES: B-06-GS3

DATE TIME FROM REF. PT
ICATION: ST. LOUIS MO BEG: 03/04/91 11:07 EAST: ____
SE/BATCH/SMO: ____/_/____ LAB: ___ END: __/__/__ __:__ NORTH: ____
ORET/SAROAD NO: _____ DOWN: 2-12 ft

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MGP	NAME
ASS	ICED	SS	SEMIVOLATILES
ASS	NONE	SV	VOLATILES
ASS	ICED	SM	METALS
ASS	NONE	ST09	CYANIDE
ASS	ICED	~~SM34~~	~~MERCURY~~ BY COLD VAP Delete.

MMENTS:

See boring & safety log #2

V/B Mod. Conc

AMPLE COLLECTED BY : Pat McCall

AFT FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: 91 ACTNO: DSX44 SAMNC: 009 QCC: _ MEDIA: SOIL PL: S P F D

TIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
CATION: _____ MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

MPLE DES: B-14 - CS4 DATE TIME FROM REF PT
CATION: ST. LOUIS MO BEG: 03/01/91 13:50 EAST: ___
SE/BATCH/SMO: ____/_/____ LAB: ___ END: __/__/__ __:__ NORTH: ___
DRET/SARDAD NO: _____ DOWN: 4-6 ft

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MGP	NAME
ASS	ICED	SS	SEMIVOLATILES
ASS	NONE	SV	VOLATILES
ASS	ICED	SM	METALS
ASS	NONE	ST09	CYANIDE
ASS	ICED	~~SM34~~	~~MERCURY BY COLD VAP~~ delete.

MMENTS:

See boring & safety logbook #2

V/B med. Conc.

AMPLE COLLECTED BY : [illegible]

RAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

Y: 91 ACTNO: DSX44 SAMNG: 010 QCC: _ MEDIA: ~~SOIL~~ water PL: S P F D

CTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
OCATION: _____ MO PROJECT NUM: 434 PT: LONGITUDE: __ __ __

AMPLE DES: B14 - GW
OCATION: ST. LOUIS MO
ASE/BATCH/SMO: ____/_/____ LAB: ___
TORET/SAROAD NO: _____

	DATE	TIME	FROM REF PT
BEG:	03/~~01~~/91	14:30	EAST: ___
END:	10~~5~~/__	__:__	NORTH: ___
			DOWN: 12-14 ft

NALYSIS REQUESTED:

ONTAINER	PRESERVATIVE	MGP	NAME
LASS	ICED	~~X~~ SS	SEMIVOLATILES
LASS	NONE	~~X~~ SV	VOLATILES
LASS	ICED	SM	METALS
LASS	NONE	~~X~~ ST09	CYANIDE
LASS	ICED	~~SM34~~	~~MERCURY BY COLD VAP~~ delete

OMMENTS:

See boring & safety logbook #2

oil & water; medium concentration

~~VTSR~~

entire sample - WATER

Mod - High conc

AMPLE COLLECTED BY : Paul Counsell

AFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: 91 ACTNO: DSX44 SAMNO: 011 QCC: _ MEDIA: SOIL PL: S P F D

TIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
CATION: St Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

MPLE DES: A-07-SB CS6 DATE TIME FROM REF PT
CATION: ST. LOUIS MO BEG: 03/01/91 17:55 EAST: ____
SE/BATCH/SMO: ____/_/____ LAB: ___ END: __/__/__ __:__ NORTH: ____
ORET/SAROAD NO: _____ DOWN: 11-11 ft.

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MGP	NAME
ASS	ICED	SS	SEMIVOLATILES
ASS	NONE	SV	VOLATILES
ASS	ICED	SM	METALS
ASS	NONE	ST09	CYANIDE
ASS	ICED	~~SM34~~	~~MERCURY BY COLD VAP~~ deleted

MMENTS:

See boring & Safety Logbook #3

V/B Med. Core

MPLE COLLECTED BY : [illegible]

RAFT

FIELD SHEET
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

Y: 91 ACTNO: DSX44 SAMNO: 012 QCC: _ MEDIA: SOIL PL: S P F D

CTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
OCATION: St Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

AMPLE DES: B13-C57
OCATION: ST. LOUIS MO BEG: 03/~~01~~/91 09:~~20~~ 21 EAST: ____
ASE/BATCH/SMO: ____/_/____ LAB: ___ END: __/__/__ __:__ NORTH: ____
OREY/SAROAD NO: _____ DOWN: 7-11 ft.

NALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
GLASS	ICED	SS	SEMIVOLATILES
GLASS	NONE	SV	VOLATILES
GLASS	ICED	SM	METALS
GLASS	NONE	STD9	CYANIDE
GLASS	ICED	~~SM34~~	~~MERCURY~~ BY COLD VAP dilute?

COMMENTS:

See boring + safety logbook FF3

V/B med. Conc.

SAMPLE COLLECTED BY : Rick Strauss

RAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

F: 91 ACTNO: DSX44 SAMNO: 013 QCC: _ MEDIA: SOIL PL: S P F D

CTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
OCATION: [illegible] MO PROJECT NUM: A34 PT: LONGITUDE: ___ __ __

AMPLE DES: SB5 - CS 7 DATE TIME FROM REF PT
OCATION: ST. LOUIS MO BEG: 03/01/91 09:45 EAST: ____
ASE/BATCH/SMO: ____/_/_____ LAB: ___ END: __/__/__ __:__ NORTH: ____
TORET/SARDAD NO: _____ DOWN: 11-12.5 ft

NALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
GLASS	ICED	SS	SEMIVOLATILES
GLASS	NONE	SV	VOLATILES
GLASS	ICED	SM	METALS
GLASS	NONE	ST09	CYANIDE
GLASS	ICED	~~SM34~~	~~MERCURY BY COLD VAP~~ delete

OMMENTS:

See boring + safety logbook #3

V/B Med. Core

AMPLE COLLECTED BY : [illegible]

:AFT FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

': 91 ACTNO: 05X44 SAMNO: 101 QCC: _ MEDIA: SOIL PL: S P F D

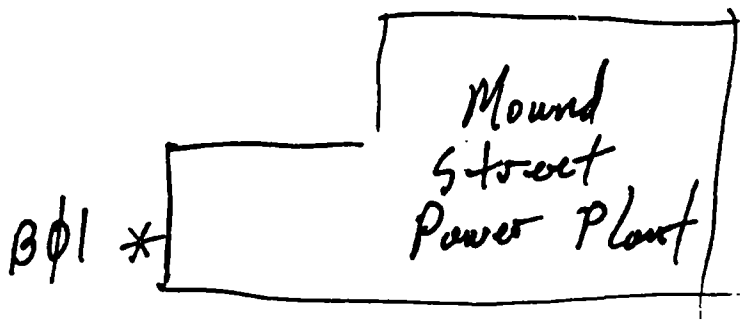
:TIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
:CATION: B01 MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

.MPLE DES: _____ DATE TIME FROM REF PT
:CATION: ST. LOUIS MO BEG: 03/04/91 13:05 EAST: ____
.SE/BATCH/SMO: ____/_/____ LAB: ___ END: __/__/__ __:__ NORTH: ____
'ORET/SAROAD NO: _____ OCWN: ____

IALYSIS REQUESTED:

:NTAINER	PRESERVATIVE	MGP	NAME
.ASS	ICED	SM	METALS
.ASS	ICED	SS	SEMIVOLATILES
.ASS	NONE	ST09	CYANIDE
.ASS	ICED	~~SM34~~	~~MERCURY~~ BY COLD VAP delete

IMMENTS: Boring Location 01
South end of old mound street plant
in drive way
0-2 ft depth
Split Collected



AMPLE COLLECTED BY : Wes McCall, John Peck

AFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: 91 ACTNO: 05X44 SAMNO: 102 QCC: _ MEDIA: SOIL PL: S P F D

TIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
CATION: _____ MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

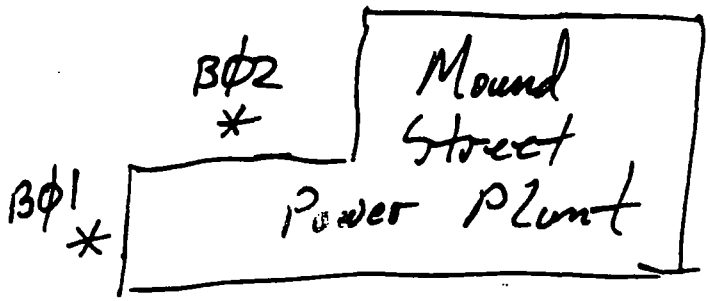
MPLE DES: _____ DATE TIME FROM REF PT
CATION: ST. LOUIS MO BEG: 03/02/91 14:20 EAST: ____
SE/BATCH/SMO: ____/_/____ LAB: __ END: __/__/__ __:__ NORTH: ____
DRET/SAROAD NO: _____ DOWN: ____

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MGP	NAME
ASS	ICED	SM	METALS
ASS	ICED	SS	SEMIVOLATILES
ASS	NONE	ST09	CYANIDE
ASS	ICED	~~SM34~~	~~MERCURY~~ BY COLD VAP delete.

MMENTS: Boring Location Ø2

Corner of old mound street
Power Plant



Split Collected

MPLE COLLECTED BY : Wes McCall, John Peck, Patty Roberts

AFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: 91 ACTNO: 05X44 SAMNO: 103 QCC: _ MEDIA: SOIL PL: S P F D

TIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
CATION: _____ MO PROJECT NUM: 434 PT: LONGITUDE: __ __ __

MPLE DES: _____ DATE & TIME FROM REF PT
CATION: ST. LOUIS MO BEG: ~~03/01/91~~ 15:30 EAST: ____
SE/BATCH/SMO: ____/_/____ LAB: __ END: 3/04/91 __:__ NORTH: ____
ORET/SAROAD NO: _____ DOWN: 1-2 FT

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MGP	NAME
ASS	ICED	SM	METALS
ASS	ICED	SS	SEMIVOLATILES
ASS	NONE	ST09	CYANIDE
ASS	ICED	~~SM34~~	~~MERCURY BY COLD VAP~~ delete

MMENTS:

SURFACE SOIL LOCATED AT THE EAST CENTRAL PART OF THE TANK FARM

- SEE MAP FOR LOCATION

SAMPLE CONSISTS OF 1 ALIQUOT AT 1 FT AND 1 ALIQUOT AT 2 FT

SPLIT SAMPLE WAS COLLECTED

MPLE COLLECTED BY : _____

AFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII

ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: 91 ACTNO: 05X44 SAMNC: 104 ICC: _ MEDIA: SOIL PL: S P F D

TIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __

CATION: B05 MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

MPLE DES: DATE TIME FROM REF PT

CATION: ST. LOUIS MO BEG: 03/21/91 12:35 EAST: ____

SE/BATCH/SMO: ____/_/____ LAB: ___ END: __/__/__ __:__ NORTH: ____

ORET/SAROAD NO: _____ DOWN: 0-2 ft

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MGP	NAME
ASS	ICED	SM	METALS
ASS	ICED	SS	SEMIVOLATILES
ASS	NONE	ST09	CYANIDE
ASS	ICED	~~SM34~~	~~MERCURY BY COLD VAP~~ delete

MMENTS: Between the two tanks at north end of tank farm

Boring Location B05

Split collected.

MPLE COLLECTED BY : Roberts, Peck, Hall

AFT FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: 91 ACTNO: DSX44 SAMNO: 105 QCC: _ MEDIA: SOIL PL: S P F D

TIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
CATION: St. Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

MPLE DES: BOT
CATION: ST. LOUIS MO BEG: 03/01/91 13:00 FROM REF PT
SE/BATCH/SMO: ____1_1_____ LAB: __ END: __105__ __:__ EAST: ___
DRET/SAROAD NO: _____ NORTH: ___
DOWN: 0-2 ft

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MGP	NAME
ASS	ICED	SM	METALS
ASS	ICED	SS	SEMIVOLATILES
ASS	NONE	ST09	CYANIDE
ASS	ICED	~~SM34~~	~~MERCURY~~ BY COLD VAP delete

MMENTS:

Between tanks 7-8

Lee boring & safety logfoot #1

MPLE COLLECTED BY : [illegible]

AFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: 91 ACTNO: DSX44 SAMNO: 106 QCC: _ MEDIA: SOIL PL: S P F D

TIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
CATION: St Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

MPLE DES: B15

CATION: ST. LOUIS MO

SE/BATCH/SMO: ____1_1_____ LAB: ___

ORET/SAROAD NO: _____

DATE TIME FROM REF PT
BEG: 03/28T/91 12:10 EAST: ____
END: __10/1__ __:__ NORTH: ____
DOWN: 0-2ft.

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MGP	NAME
ASS	ICED	SM	METALS
ASS	ICED	SS	SEMIVOLATILES
ASS	NONE	ST09	CYANIDE
ASS	ICED	~~SM34~~	~~MERCURY BY COLD VAP~~ delete

MMENTS:

All boring + safety logbook #2

South of little tankfarm near levee wall

AMPLE COLLECTED BY : Erik Nilsen

AFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: 91 ACTNO: DSX44 SAMNO: 107 GCC: _ MEDIA: SOIL PL: S P F D

TIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
CATION: ST. LOUIS MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

MPLE DES: GW6 K.B. DATE TIME FROM REF PT
CATION: ST. LOUIS MO BEG: 03/01/91 15:15 EAST: ____
SE/BATCH/SMO: ____1_1____ LAB: __ END: __1/01__ __:__ NORTH: ____
ORET/SAROAD NO: _____ DOWN: 0.2 ft

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MGP	NAME
ASS	ICED	SM	METALS
ASS	ICED	SS	SEMIVOLATILES
ASS	NONE	ST09	CYANIDE
ASS	ICED	~~SM34~~	~~MERCURY~~ BY COLD VAP delete.

MMENTS:

20ft south of little transformer
See boring & safety logbook #2

MPLE COLLECTED BY : Rick McCall

AFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: 91 ACTNO: 05X44 SAMNO: 108 SCC: _ MEDIA: SOIL PL: S P F D

TIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
CATION: [illegible] MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

MPLE DES: 017 RB DATE TIME FROM REF PT
CATION: ST. LOUIS MO BEG: 03/01/91 15:15 EAST: ____
SE/BATCH/SMO: ____/_/____ LAB: __ END: 10/__ __:__ NORTH: ____
ORET/SAROAD NO: _____ DOWN: 0-2ft

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MSP	NAME
ASS	ICED	SM	METALS
ASS	ICED	SS	SEMIVOLATILES
ASS	NONE	ST09	CYANIDE
ASS	ICED	~~SM34~~	~~MERCURY~~ BY COLD VAP delete

MMENTS:

35' north of little tankfarm

MPLE COLLECTED BY : [illegible]

AFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: 91 ACTNO: 05X44 SAMNO: 109 QCC: _ MEDIA: SOIL PL: S P F D

TIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
CATION: ST. LOUIS MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

MPLE DES: SB
CATION: ST. LOUIS MO
SE/BATCH/SMO: ____1_1_____ LAB: ___
DRET/SAROAD NO: _____

DATE TIME FROM REF PT
BEG: 05/01/91 16:52 EAST: ____
END: 1061 __:__ NORTH: ____
DOWN: 0-2 ft

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MGP	NAME
ASS	ICED	SM	METALS
ASS	ICED	SS	SEMIVOLATILES
ASS	NONE	ST09	CYANIDE
ASS	ICED	~~SM34~~	~~MERCURY BY COLD VAP~~ delete

MENTS:

160' north of little tankfarm

see logbook #2

MPLE COLLECTED BY : Rick Driscoll

RAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

Y: 91 ACTNO: DSX44 SAMNO: 110 QCC: _ MEDIA: SOIL PL: S P F D

CTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
OCATION: St. Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

AMPLE DES: RI2
OCATION: ST. LOUIS MO
ASE/BATCH/SMO: ____/_/____ LAB: ___
TORET/SAROAD NO: _____

DATE TIME FROM REF PT
BEG: 03/01/91 ~~12:17~~ EAST: ____
END: 03/01/91 07:12 NORTH: ____
14 SH DOWN: 0-2 ft.

NALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
GLASS	ICED	SM	METALS
GLASS	ICED	SS	SEMIVOLATILES
GLASS	NONE	ST09	CYANIDE
GLASS	ICED	SM34	~~MERCURY~~ delete BY COLD VAP

OMMENTS:

8 oz ~~jar~~ wide mouth

130' from railroad track

Logbook #2

Brown/Haxes SH

AMPLE COLLECTED BY : _____

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: DSX44 SAMNO: 111 QCC: _ MEDIA: SOIL PL: S P F D

ACTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: St Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

SAMPLE DES: RSD
LOCATION: ST. LOUIS MO
CASE/BATCH/SMO: ____/_/____ LAB: ___
STORET/SAROAD NO: _____

DATE TIME FROM REF PT
BEG: 03/01/91 ~~08:30~~ EAST: ____
END: 03/01/91 07:32 NORTH: ____
DOWN: 2-3 ft

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
GLASS	ICED	SM	METALS
GLASS	ICED	SS	SEMIVOLATILES
GLASS	NONE	ST09	CYANIDE
GLASS	ICED	SM34	~~MERCURY~~ delete BY COLD VAP

COMMENTS:

S. of Mulberry
180' E. of R.R. track
Logbook #2

Brown / Hayes SH

SAMPLE COLLECTED BY : [signature]

RAFT FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: 3SX44 SAMNO: 112 ICC: _ MEDIA: SOIL PL: S P F D

ACTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: _____ MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

SAMPLE DES: ____/_____ DATE TIME FROM REF PT
LOCATION: ST. LOUIS MO BEG: 03/04/91 ~~10:30~~ EAST: ____
CASE/BATCH/SMO: _____/_/_____ LAB: ___ END: 04/91 12:30 NORTH: ____
STORET/SARDAD NO: _____ 13 AM AM DOWN: 0 ft

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
GLASS	ICED	SM	METALS
GLASS	ICED	SS	SEMIVOLATILES
GLASS	NONE	ST09	CYANIDE
GLASS	ICED	SM34	~~MERCURY~~ BY COLD VAP delete

COMMENTS:

82' W. of N 1st Ave

Logbook #2

Boring #21

Hayes / Brown SH

SAMPLE COLLECTED BY : _____

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: 05X44 SAMNO: 201 SCC: _ MEDIA: WATER PL: S P F D

ACTIVITY DES: LACLEDE COAL GAS — REF LATITUDE: __ __ __
LOCATION: _____ ID PROJECT NUM: 434 PT: LONGITUDE: __ __ __

SAMPLE DES: _____ DATE TIME FROM REF PT
LOCATION: ST. LOUIS MO BEG: ~~03/04/91~~ 3/05/91 : EAST: ___
CASE/BATCH/SMO: ____/_/____ LAB: ___ END: __/__/__ 12:12 NORTH: ___,
STORET/SAROAD NO: _____ DOWN: 26

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
2 VOA VIALS	ICED	WV	VOLATILES ✓
CUBI	5 ML HNO3	WM	METALS ✓
GLASS	ICED	WS	SEMIVOLATILES ✓
4 OZ PLASTIC	FILTER, HNO3	W07	IH DISSOLVED METALS ✓
CUBI	NAOH	WT09	CYANIDE, TOTAL ✓
CUBI	5 ML HNO3	~~WM34~~	~~MERCURY~~ BY COLD VAP ✓ delete, m

COMMENTS:

GW sample

~~Collected sample at 26 feet.~~ cw

Location = 69 feet south from center of Mullanphy Street and 50 feet East of eastern most RR tracks.

STATIC WATER LEVEL : 24 FT
DEPTH OF WELL : 26 FT.

pH = 7.58

Conductivity = 5000

Temp. = 11.0

W. Williams

SAMPLE COLLECTED BY : ~~Rogers Heinz~~ (PH)

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: 05X44 SAMNO: 202 QCC: _ MEDIA: WATER PL: S P F D

ACTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: _____ 40 PROJECT NUM: A34 PT: LONGITUDE: __ __ __

SAMPLE DES: _____ 03/06/91 (PE)
LOCATION: ST. LOUIS MO DATE TIME FROM REF PT
CASE/BATCH/SMO: ____/_/____ LAB: ___ BEG: ~~03/01/91~~ __:__ EAST: ____
STORET/SAROAD NO: _____ END: __/__/__ 10:00 NORTH: ____
DOWN: 33'

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
2 VOA VIALS	ICED	WV	VOLATILES ✓
CUBI	5 ML HNO3	WM	METALS ✓
GLASS	ICED	WS	SEMIVOLATILES ✓
1 OZ PLASTIC	FILTER, HNO3	WO7	IH DISSOLVED METALS ✓
CUBI	NAOH	WT09	CYANIDE, TOTAL ✓
CUBI	5 ML HNO3	• ~~WM34~~	~~MERCURY~~ BY COLD VAP Auto-

COMMENTS:

Coll' sample
Terminal RR Assoc. 147 ft. West of
RR track and 78 ft. South of the
center of Mullanphy Street.
Depth to static water table = 24'
Depth of well = 33'

pH = 7.81
$T_{emp.}$ = 7°C
Cond. = 2000 mmhos

SAMPLE COLLECTED BY : Jowers Williams (PE)

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: DSX44 SAMNO: 203 QCC: _ MEDIA: WATER PL: S P F D

ACTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: St. Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

SAMPLE DES: _____ DATE TIME FROM REF PT
LOCATION: ST. LOUIS MO BEG: ~~03/01/91~~ 03/07/92 __:__ EAST: ____
CASE/BATCH/SMO: ____/_/_____ LAB: ___ END: __/__/__ 14:30 NORTH: ____
STORET/SAROAD NO: _____ DOWN: 47'3"

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
2 VOA VIALS	ICED	WV	VOLATILES
CUBI	5 ML HNO3	WM	METALS
GLASS	ICED	WS	SEMIVOLATILES
4 OZ PLASTIC	FILTER, HNO3	W07	IH DISSOLVED METALS
CUBI	NAOH	WT09	CYANIDE, TOTAL
CUBI	5 ML HNO3	WM34	~~MERCURY~~ BY COLD VAP dissolved.

COMMENTS: ARMY CORPS OF ENGINEERS

Engineering Test Well

Location = 147 feet north of the center of Mullanphy Street and 40 feet west of concrete flood level.

Depth of well = 47.3"

Static water level = 27.3"

pH = 6.32.

Cond. - 1500

Temp. = 9°C.

SAMPLE COLLECTED BY : Robert L. Williams

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: 3SX44 SAMNO: 204 QCC: _ MEDIA: WATER PL: S P G D

ACTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: St. Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

SAMPLE DES: _____ DATE TIME FROM REF PT
LOCATION: ST. LOUIS MO BEG: ~~03/01/91~~ 03/07/91 __:__ EAST: ____
CASE/BATCH/SMO: ____/_/____ LAB: ___ END: __/__/__ ~~16~~ 12:~~45~~ NORTH: ____
STORET/SAROAD NO: _____ DOWN: ~~48'~~ 48'

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
3 VOA VIALS	ICED	WV	VOLATILES
CUBI	5 ML HNO3	WM	METALS
GLASS	ICED	WS	SEMIVOLATILES
4 OZ PLASTIC	FILTER, HNO3	W07	IH DISSOLVED METALS
CUBI	NAOH	WT09	CYANIDE, TOTAL
CUBI	5 ML HNO3	~~WM34~~	~~MERCURY BY COLD VAP~~ Colette

COMMENTS:

ARMY CORPS OF ENGINEERS
Engineering Test well
Location = ~~216 feet north of well (sample #203) was collected from~~ 363 feet north of the center of Mallanphy Street and 25 feet west of the concrete flood levee.
Depth of well = 48'
Static water level: 26'

pH = 6.21.

Temp. = 9°C.

Cond. = 400 umhos

SAMPLE COLLECTED BY : Roberts / Williams

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: 05X44 SAMNO: 205 QCC: 1 MEDIA: WATER PL: S P F D

ACTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: B13 - St. Louis MO PROJECT NUM: 034 PT: LONGITUDE: __ __ __

SAMPLE DES: Equip. Rinsate
LOCATION: ST. LOUIS MO
CASE/BATCH/SMO: ____/_/____ LAB: ___
STORET/SAROAD NO: _____

DATE TIME FROM REF PT
SEG: 03/04/91 08:30 EAST: ____
END: __/__/__ __:__ NORTH: ____
DOWN: ____

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
2 VOA VIALS	ICED	WV	VOLATILES
CUBI	5 ML HNO3	WM	METALS
GLASS	ICED	WS	SEMIVOLATILES
~~4 OZ PLASTIC~~	~~FILTER, HNO3~~	~~W07~~	~~IN DISSOLVED METALS~~
CUBI	NAOH	WT09	CYANIDE, TOTAL
CUBI	5 ML HNO3	~~WM34~~	~~MERCURY BY COLD VAP~~ Water

COMMENTS: Rinsate of auger and split spoon Samples using clean drillers decon water.

SAMPLE COLLECTED BY : McCall, Peck, Strobel

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: DSX44 SAMNO: 206 OCC: _ MEDIA: WATER PL: S P F D

CTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
OCATION: St. Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

AMPLE DES: _____ DATE & TIME FROM REF PT
OCATION: ST. LOUIS MO BEG: ~~03/01/91~~ __:__ EAST: ___
ASE/BATCH/SMO: ____/_/_____ LAB: ___ END: 3/9/91 10:27 NORTH: ___
TORET/SAROAD NO: _____ DOWN: 52 FT

NALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
_ VOA VIALS	ICED	WV	VOLATILES
CUBI	5 ML HNO3	WM	METALS
LASS	ICED	WS	SEMIVOLATILES
OZ PLASTIC	FILTER, HNO3	W07	IH DISSOLVED METALS
CUBI	NAOH	WT09	CYANIDE, TOTAL
UBI	5 ML HNO3	~~WM34~~	~~MERCURY BY COLD VAP~~

Deleted.

COMMENTS:

COLLECTED FROM ARMY CORPS OF ENGINEERS ENGINEERING TEST WELL

LOCATION: 20 FT. WEST OF CONCRETE LEVEE WALL AND ~ 2118 FT N. OF THE CENTER OF MULLANPHY ST.

DEPTH OF WELL: 52 FT
STATIC WATER LEVEL: 29 FT.

- pH = 6.14
- COND. = 1600 umhos
- TEMP. = 11°C

AMPLE COLLECTED BY : ROBERTS & WILLIAMS

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: DSX44 SAMNO: ~~207~~ 206D QCC: _ MEDIA: WATER PL: S P F D

CTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: St. Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

AMPLE DES: _____ DATE TIME FROM REF PT
_OCATION: ST. LOUIS MO BEG: ~~03/01/91~~ 3/9/91 __:__ EAST: ___
CASE/BATCH/SMO: ____1_1_____ LAB: ___ END: 3/9/91 10:20 NORTH: ___
TORET/SAROAD NO: _____ DOWN: 52 FT

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
VOA VIALS	ICED	WV	VOLATILES
CUBI	5 ML HNO3	WM	METALS
GLASS	ICED	WS	SEMIVOLATILES
OZ PLASTIC	FILTER, HNO3	W07	IH DISSOLVED METALS
UBI	NAOH	WT09	CYANIDE, TOTAL
CUBI	5 ML HNO3	~~WM34~~	~~MERCURY BY COLD VAP~~ delete.

COMMENTS:

COLLECTED FROM ARMY CORPS OF ENGINERS
ENGINEERING TEST WELL

LOCATION: 20 FT. WEST OF CONCRETE LEVEE WALL AND ~ 2118 FT NORTH OF THE CENTER OF MULLANPHY ST.

DEPTH OF WELL: 52 FT
STATIC WATER LEVEL = 29 FT.
pH = 6.14
COND. = 1600 umhos
TEMP. = 11°C

SAMPLE COLLECTED BY : ROBERTS + WILLIAMS

Chris G. Ellis

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: DSX44 SAMNC: 207 ICC: C MEDIA: WATER PL: S P F D

ACTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: St. Louis MO PROJECT NUM: 434 PT: LONGITUDE: __ __ __

SAMPLE DES: _____ DATE TIME FROM REF PT
LOCATION: ST. LOUIS MO BEG: ~~03/04/91~~ 03/12/91 (12) :__ EAST: ____
CASE/BATCH/SMO: _____/_/_____ LAB: ___ END: 03/09/91 (12) :__ NORTH: ____
TORET/SAROAD NO: _____ 13:18 (12) DOWN: ____

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
2 VOA VIALS	ICED	WV	VOLATILES
CUBI	5 ML HNO3	WM	METALS
GLASS	ICED	WS	SEMIVOLATILES
1 OZ PLASTIC	FILTER, HNO3	WO7	IH DISSOLVED METALS
CUBI	NAOH	WT09	CYANIDE, TOTAL
CUBI	5 ML HNO3	~~WM34~~	~~MERCURY~~ BY COLD VAP
2002 glass	Iced	WV8	Total Petro. Hydrocarbons

COMMENTS:

Field Blank

SAMPLE COLLECTED BY : Williams/Roberts

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV., 25 FUNSTON RD. KANSAS CITY, KS 66115

~~208 PB~~

FY: 91 ACTNO: DSX44 SAMNO: ~~207~~ 208 22 OCC: S MEDIA: WATER PL: S P F D

CTIVITY DES: LACLEDE COAL GAS
LOCATION: St. Louis MO PROJECT NUM: A34 REF LATITUDE: __ __ __
PT: LONGITUDE: __ __ __

AMPLE DES: _____
DATE TIME FROM REF PT
OCATION: ST. LOUIS MO BEG: ~~03/01/91~~ 03/08/91 __:__ EAST: ____
CASE/BATCH/SMO: ____/_/____ LAB: ___ END: __/__/__ 11:00 NORTH: ____
TORET/SAROAD NO: _____ DOWN: ____

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
VOA VIALS	ICED	WV	VOLATILES
CUBI	5 ML HNO3	WM	METALS
GLASS	ICED	WS	SEMIVOLATILES
OZ PLASTIC	FILTER, HNO3	W07	IH DISSOLVED METALS
JBI	NAOH	WT09	CYANIDE, TOTAL
CUBI	5 ML HNO3	~~WM34~~	~~MERCURY~~ ~~BY COLD VAP~~ Delete.

COMMENTS:

Geoprobe Pipe Rinsate Sample
Poured through pipe screen and
probe pipe.

COLLECTED BY APEX OIL OFFICE

pH = 7.00
Temp = 4°C.
Cond. = 16 umhos

SAMPLE COLLECTED BY : Roberts, Williams

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: DSX44 SAMNO: 307 [redacted] MEDIA: WATER PL: S P F D

CTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: St. Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

AMPLE DES: _____ DATE TIME FROM REF PT
_OCATION: ST. LOUIS MO BEG: ~~03/04/91~~ RG EAST: ____
CASE/BATCH/SMO: ____/_/____ LAB: ___ END: 03/09/91 __:__ NORTH: ____
TORET/SAROAD NO: _____ 12:30 DOWN: ____

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
VOA VIALS	ICED	*WV	VOLATILES
~~CUBI~~	~~5 ML HNO3~~	~~WM~~	~~METALS~~
~~GLASS~~	~~ICED~~	~~WS~~	~~SEMIVOLATILES~~
~~OZ PLASTIC~~	~~FILTER, HNO3~~	~~W07~~	~~IH DISSOLVED METALS~~
~~CUBI~~	~~NAOH~~	~~W108~~	~~CYANIDE, TOTAL~~
CUBI	5 ML HNO3	WM34	MERCURY ~~BY COLD VAP~~

PR

COMMENTS:

Trip Blank

SAMPLE COLLECTED BY : Williams / Roberts

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: 05X44 SAMNO: 301 QCC: _ MEDIA: WATER PL: S P F D

ACTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: _____ MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

SAMPLE DES: _____ DATE TIME FROM REF PT
LOCATION: ST. LOUIS MO BEG: ~~03/04/91~~ 03/06/91 __:__ EAST: ____
CASE/BATCH/SMO: ____/_/____ LAB: ___ END: __/__/__ ~~14:45~~ NORTH: ____
STORET/SAROAD NO: _____ DOWN: ____

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
2 VOA VIALS	ICED	WV	VOLATILES ✓
CUBI	5 ML HNO3	WM	METALS ✓
GLASS	ICED	WS	SEMIVOLATILES ✓
4 OZ PLASTIC	FILTER, HNO3	W07	IM DISSOLVED METALS ✓
CUBI	NAOH	WT09	CYANIDE, TOTAL ✓
CUBI	5 ML HNO3	~~WM34~~	~~MERCURY 3Y COLD VAP~~ ✓ deleted
~~2 40 ML VOA VLS~~	~~ICED~~	WV86	HYDROCARBONS, TOTAL PETROL ✓

800z 9/95 (PE)

COMMENTS:

SW sample

Abandoned Pump House, Collected at the SE corner of pump house

pH = 8.15

Temp. = 7°C

Cond. = 440 umhos

SAMPLE COLLECTED BY : Roberts/Williams

RAFT FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

TY: 01 ACTNO: 05Y44 SAMNO: ~~[illegible]~~ 3010 CC: _ MEDIA: WATER PL: S P F D

CTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: _____ PROJECT NUM: 334 PT: LONGITUDE: __ __ __

AMPLE DES: _____ DATE TIME FROM REF PT
LOCATION: ST. LOUIS MO BEG: ~~03/01/91~~ 03/01/91 __:__ EAST: ____
ASE/BATCH/SMO: _____/_/_____ LAB: ___ END: __/__/__ 14:45 NORTH: ____
TORET/BARCAD NO: _____ DOWN: ____

NALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	AGP	NAME
VOA VIALS	ICED	WV	VOLATILES ✓
CUBI	5 ML HNO3	WM	METALS ✓
GLASS	ICED	WS	SEMIVOLATILES ✓
OZ PLASTIC	FILTER, HNO3	W07	IH DISSOLVED METALS ✓
CUBI	NAOH	WT09	CYANIDE, TOTAL ✓
CUBI	5 ML HNO3	~~WM34~~	~~MERCURY BY COLD VAP~~ ✓ delete
~~40 ML VOA VLS~~ 80 oz glass (PE)	ICED	WV86	HYDROCARBONS, TOTAL PETROL ✓

OMMENTS:

Duplicate sample of #301

AMPLE COLLECTED BY : Scott Williams

DRAFT FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: 3SX44 SAMNO: 302 OCC: _ MEDIA: WATER PL: S P F D

CTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
OCATION: _____ 40 PROJECT NUM: A34 PT: LONGITUDE: ___ __ __

AMPLE DES: _____ DATE TIME FROM REF PT
OCATION: ST. LOUIS 10 BEG: ~~03/01/91~~ 03/04/91 PR __:__ EAST: ____
ASE/BATCH/SMO: _____/_/_____ LAB: ___ END: __/__/__ 12:15 NORTH: ____
TORET/SAMOAD NO: _____ DOWN: ___

ANALYSIS REQUESTED:

CNTAINER	PRESERVATIVE	MGP	NAME
VOA VIALS	ICED	WV	VOLATILES ✓
CUBI	5 ML HNO3	WM	METALS ✓
GLASS	ICED	WS	SEMIVOLATILES ✓
OZ PLASTIC	FILTER, HNO3	W07	IH DISSOLVED METALS ✓
CUBI	NAOH	WT09	CYANIDE, TOTAL ✓
CUBI	5 ML HNO3	~~WM34~~	~~MERCURY BY COLD VAP~~ deleted
~~40 ML VOA VLS ICED~~		WV86	HYDROCARBONS, TOTAL PETROL ✓

80 oz glass (X2)

COMMENTS:

SW sample
Collected about 70ft upstream of NE corner of the abandoned pump house.

pH = 7.87

Temp. = 6° C

Cond. = 450 umhos

SAMPLE COLLECTED BY : Roberts Williams

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: 05X44 SAMNO: 303 QCC: _ MEDIA: WATER PL: S P F D

ACTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: St Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

SAMPLE DES: ~~03/01/91~~ 03/01/91 (corrected)
LOCATION: ST. LOUIS MO BEG: ~~03/01/91~~ __:__ TIME FROM REF PT
CASE/BATCH/SMO: ____/_/____ LAB: ___ END: __/__/__ 14:00 EAST: ____
TORET/SAROAD NO: _____ NORTH: ____
DOWN: ____

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
2 VOA VIALS	ICED	WV	VOLATILES
1 CUBI	5 ML HNO3	WM	METALS
1 GLASS	ICED	WS	SEMIVOLATILES
1 QT PLASTIC	FILTER, HNO3	WQ7	IH DISSOLVED METALS
1 CUBI	NAOH	WT09	CYANIDE, TOTAL
1 CUBI	5 ML HNO3	~~WM34~~	~~MERCURY BY COLD VAP~~ delete
~~40 ML VOA VLS~~	~~ICED~~	WV86	HYDROCARBONS, TOTAL PETROL
80 oz glass			

COMMENTS:

SW SAMPLE / Miss. River

Collected 330 feet south (downstream) of the southeast corner of the abandoned pump house

pH = 7.27

Temp. = 6°C

Cond. = 360 μmhos

SAMPLE COLLECTED BY : Roberts / Brown

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: 05X44 SAMNO: 304 QCC: _ MEDIA: WATER PL: S P F D

ACTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: _____ MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

SAMPLE DES: _____ DATE TIME FROM REF PT
LOCATION: ST. LOUIS MO ~~BEG: 03/01/91 __:__~~ EAST: ____
CASE/BATCH/SMO: ____/_/____ LAB: ___ END: 2/21/91 E:55 NORTH: ____
STORET/SAROAD NO: _____ DOWN: ____

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
2 VOA VIALS	ICED	WV	VOLATILES ✓
CUBI	5 ML HNO3	WM	METALS ✓
GLASS	ICED	WS	SEMIVOLATILES ✓
4 OZ PLASTIC	FILTER, HNO3	W07	IH DISSOLVED METALS ✓
CUBI	NAOH	WT09	CYANIDE, TOTAL ✓
CUBI	5 ML HNO3	~~WM34~~	~~MERCURY 3T COLD VAP~~ delete.m
~~2 40 ML VOA VLS ICED~~		WV86	HYDROCARBONS, TOTAL PETROL ✓

80 02 9655

COMMENTS:

SURFACE WATER SAMPLE FROM THE
ILLINOIS AMERICAN DRINKING WATER
INTAKE IN E. ST. LOUIS.

, pH : 7.05 ,
, CONDUCTIVITY : 510 , UMHOS ,
, TEMP. : 3°C ,

SAMPLE COLLECTED BY : _____

RAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: 05X44 SAMNO: ~~335~~ 3242 CC: _ MEDIA: WATER PL: S P F D

ACTIVITY DES: LACLEDE GAS REF LATITUDE: __ __ __
LOCATION: _____ MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

SAMPLE DES: _____ DATE TIME FROM REF PT
LOCATION: ST. LOUIS MO ~~BEG: 03/01/91 __:__~~ EAST: ____
CASE/BATCH/SMC: _____/_/_____ LAB: ___ END: 3/1/91 __:55 NORTH: ____
STORET/SAROAD NO: _____ DOWN: ____

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
2 VOA VIALS	ICED	WV	VOLATILES ✓
CUBI	5 ML HNO3	WM	METALS ✓
GLASS	ICED	WS	SEMIVOLATILES ✓
½ OZ PLASTIC	FILTER, HNO3	W07	IH DISSOLVED METALS ✓
CUBI	NAOH	WT09	CYANIDE, TOTAL ✓
CUBI	5 ML HNO3	~~WM34~~	~~MERCURY BY COLD VAP~~ ✓ delete pm
~~40 ML VOA VLS ICED~~		WV86	HYDROCARBONS, TOTAL PETROL ✓

800z glass

COMMENTS:

DUPLICATE SURFACEWATER SAMPLE FROM THE ILLINOIS AMERICAN DRINKING WATER INTAKE IN E. ST. LOUIS

SAMPLE COLLECTED BY : _____

DRAFT FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: 05X44 SAMNO: 401 OCC: _ MEDIA: SOIL PL: S P F D

CTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
OCATION: St. Louis MO PROJECT NUM: 434 PT: LONGITUDE: __ __ __

AMPLE DES: _____ DATE TIME FROM REF PT
OCATION: ST. LOUIS MO BEG: ~~93/01/01~~ 03/09/91 :__ EAST: ____
ASE/BATCH/SMO: ____/_/____ LAB: ___ END: __/__/__ 13:30 NORTH: ____
TORET/SARDAD NO: _____ DOWN: 0-6"

NALYSIS REQUESTED:

ONTAINER	PRESERVATIVE	MGP	NAME
LASS	NONE	SV	VOLATILES
GLASS	ICED	SM	METALS
LASS	ICED	SS	SEMIVOLATILES
LASS	NONE	ST09	CYANIDE
GLASS	ICED	~~SM34~~	~~MERCURY BY COLD VAP~~ delete
GLASS	ICED	SV54	HYDROCARBONS, TOTAL PETROL

COMMENTS:

SEDIMENT SAMPLE / Grab
Collected about 150 ft downstream from the SE corner of the abandoned pump house.

AMPLE COLLECTED BY : Roberts Williams

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: 05X44 SAMNO: ~~404~~ 901D QCC: _ MEDIA: SOIL PL: S P F D

ACTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: St. Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

SAMPLE DES: _____ DATE: ~~03/04/91~~ 03/06/91 TIME FROM REF PT
LOCATION: ST. LOUIS MO BEG: ~~03/01/91~~ __:__ EAST: ____
CASE/BATCH/SMO: _____/_/_____ LAB: ___ END: __/__/__ ~~15:30~~ NORTH: ____
STORET/SAROAD NO: _____ DOWN: 0-6"

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
GLASS	NONE	SV	VOLATILES
GLASS	ICED	SM	METALS
GLASS	ICED	SS	SEMIVOLATILES
GLASS	NONE	ST09	CYANIDE
GLASS	ICED	~~SM34~~	~~MERCURY BY COLD VAP~~ delete
GLASS	ICED	SV54	HYDROCARBONS, TOTAL PETROL

COMMENTS:

Duplicate of #401

SAMPLE COLLECTED BY : Roberts/Williams

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: DSX44 SAMNO: 402 ICC: _ MEDIA: SOIL PL: S P E D

ACTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: St Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

SAMPLE DES: _____ 03/06/91 (R)
LOCATION: ST. LOUIS MO DATE TIME FROM REF PT
CASE/BATCH/SNO: ____1_1_____ LAB: ___ BEG: ~~03/01/91~~ __:__ EAST: ____
TORET/SAROAD NO: _____ END: __/__/__ 12:35 NORTH: ____
DOWN: 0-6 "

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
GLASS	NONE	SV	VOLATILES
GLASS	ICED	SM	METALS
GLASS	ICED	SS	SEMIVOLATILES
GLASS	NONE	ST09	CYANIDE
GLASS	ICED	~~SM34~~	~~MERCURY BY COLD VAP~~ delete
GLASS	ICED	SV54	HYDROCARBONS, TOTAL PETROL

COMMENTS:

SEDIMENT SAMPLE / GRAB
Collected about 60 feet south of
SW sample # 302.

SAMPLE COLLECTED BY : Brown / Williams

RAFT FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNO: 05X44 SAMNO: 403 DCC: _ MEDIA: SOIL PL: S P F D

ACTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: St Louis ID PROJECT NUM: 434 PT: LONGITUDE: __ __ __

SAMPLE DES: _____ 03/07/91(PR) DATE TIME FROM REF PT
LOCATION: ST. LOUIS MO BEG: ~~03/07/91~~ __:__ EAST: ____
CASE/BATCH/SMO: _____/_/_____ LAB: ___ END: __/__/__ 14:15 NORTH: ____
STORET/SAROAD NO: _____ DOWN: 0-6"

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
GLASS	NONE	SV	VOLATILES
GLASS	ICED	SM	METALS
GLASS	ICED	SS	SEMIVOLATILES
GLASS	NONE	ST09	CYANIDE
GLASS	ICED	~~SM34~~	~~MERCURY BY COLD VAR~~ delete.
GLASS	ICED	SV54	HYDROCARBONS, TOTAL PETROL

COMMENTS:

SEDIMENT SAMPLE / Crab / Miss. River

Collected 330 feet south (downstream) of the southeast corner of the abandoned pump house.

SAMPLE COLLECTED BY : Roberts Brown

Solids units therefore Sediment for media do

DRAFT FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 91 ACTNC: DSX44 SAMNO: 501 QCC: _ MEDIA: ~~WATER~~ S PL: S P F D

ACTIVITY DES: LACLEDE COAL GAS REF LATITUDE: __ __ __
LOCATION: St. Louis MO PROJECT NUM: A34 PT: LONGITUDE: __ __ __

SAMPLE DES: 80,000 gal. tank #80-1
LOCATION: ST. LOUIS MO
CASE/BATCH/SMO: ____/_/____ LAB: ___
TOPET/SAROAD NO: _____

	TIME	FROM REF PT
BEG: 03/~~04~~/91	9:45	EAST: ___
END: __/__/__	__:__	NORTH: ___
		DOWN: ___

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
VOA VIALS	ICED	WV	VOLATILES
~~GLASS 2-oz wide~~	ICED	WS	SEMIVOLATILES
40 ML VOA VLS	ICED	~~HYDC~~ SV54	HYDROCARBONS, TOTAL PETROL

COMMENTS:

Sample collected out of side valve of an 80,000 gal. tank #80-1. It is located on the S.W. corner of the tank farm

High Concentration sample - Oil Sample

SAMPLE COLLECTED BY : Keith A. Brown

DRAFT FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

CY: 91 ACTNO: DSX44 SAMNO: 004 QCC: P MEDIA: WATER PL: S P F D

ACTIVITY DES: LACLEDE COAL GAS REF LATITUDE:
LOCATION: MO PROJECT NUM: 034 PT: LONGITUDE:

SAMPLE DES: LACLEDE COAL GAS SITE PE SAMPLE DATE TIME FROM REF PT
LOCATION: ST. LOUIS MO BEG: 03/08/91 EAST:
CASE/BATCH/SAU: / / LAB: END: / / NORTH:
STORET/SAROAD NO: DOWN:

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
2 VOA VIALS	ICED	WV	VOLATILES
GLASS	ICED	WS	SEMIVOLATILES
CUBI	5 ML HNO3	WM	METALS
4 OZ PLASTIC	FILTER,HNO3	W07	TH DISSOLVED METALS
CUBI	NAOH	W109	CYANIDE, TOTAL
CUBI	5 ML HNO3	~~WHG~~	~~MERCURY BY COLD VAP~~ delete.

COMMENTS:

SAMPLE COLLECTED BY

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
KEITH Brown	[illegible]	05-06 / 03 / 91	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	CUBITAINER	BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS OTHER INFORMATION (condition of samples upon receipt, other sample numbers etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
DSX44301	3	1			1	✓					EMCO 579SA, 24
DSX44303	3	1			1	✓					"
DSX44301	3	2			1	✓					"
DSX44301D	3	2			1	✓					"
DSX44302	3	2			1	✓					"
DSX44304	3	2			1	✓					"
DSX44304D	3	2			1	✓					"
	21	12			7						

DESCRIPTION OF SHIPMENT	MODE OF SHIPMENT
33 PIECE(S) CONSISTING OF Ø BOX(ES)	___ COMMERCIAL CARRIER ___
2 ICE CHEST(S). OTHER ___	___ COURIER
	X SAMPLER CONVEYED ___ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
Keith Brown — [X] SEALED [ ] UNSEALED	3/7	1130	William Oberle — [X] SEALED [ ] UNSEALED	Transport to EPA Lab [illegible]
RELINQUISHED BY	**DATE**	**TIME**	**RECEIVED BY**	**REASON FOR CHANGE OF CUSTODY**
William Oberle — [X] SEALED [ ] UNSEALED	3/8/91	0921	Scott Hayes — [X] SEALED [ ] UNSEALED	Transport to EPA R VII Lab
RELINQUISHED BY	**DATE**	**TIME**	**RECEIVED BY**	**REASON FOR CHANGE OF CUSTODY**
Scott Hayes — [X] SEALED [ ] UNSEALED	3/8/91	1205	[illegible] Evans — [X] SEALED [ ] UNSEALED	Reced @ EPA Lab

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
TRITA A. BROWN	LACLEDE COAL GAS	14 / 3 / 91	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	NUMBERS OF CONTAINERS: SUBITAINER	TOTAL VOLUME	VIALS EA. SET	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS OTHER INFORMATION condition of samples upon receipt, other sample numbers, etc.)
03444-110		2			✓				
111		2			✓				
112		2			✓				

DESCRIPTION OF SHIPMENT

6 PIECE(S) CONSISTING OF _____

_____ ICE CHEST 3/ OTHER _____

MODE OF SHIPMENT

_____ COMMERCIAL CARRIER _____

_____ COURIER

X SAMPLER CONVEYED

_____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
Trita A. Brown	3/14	12:45	[illegible]	Analysis
☐ SEALED ☐ UNSEALED			☐ SEALED ☐ UNSEALED	
RELINQUISHED BY			RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED ☐ UNSEALED			☐ SEALED ☐ UNSEALED	
RELINQUISHED BY			RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED ☐ UNSEALED			☐ SEALED ☐ UNSEALED	

EPA [illegible]

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Keith M. Ricou	Laclede Coal Gas	09 / 03 / 01	1 of 2

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
05X44=203	3	1			1	✓					
-204	3	1			1	✓					
-205F	3	1			1	✓					
-207F	3	2			1	✓					
-208F	3	1			1	✓					
-209F					1	✓					
-206	6	2			2	✓					QC (extra volume) no
-206D	3	1			1	✓					
-303	3	2			1	✓					
001					1		✓				
002					1		✓				
003					1		✓				
004					1		✓				
005					1		✓				
006			2		1		✓				
007			2		1		✓				
008			2		1		✓				
009			2		1		✓				
010			2		1		✓				Sample changed to water see QC
011			2		1		✓				
012			2		1		✓				
013			2		1		✓				
501					3					✓	
total	26	11	16		26						

DESCRIPTION OF SHIPMENT

74 PIECE(S) CONSISTING OF 1 BOX(ES)

1 ICE CHEST(S). OTHER _____

MODE OF SHIPMENT

_____ COMMERCIAL CARRIER _____

_____ COURIER

X SAMPLER CONVEYED (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
[signature] SEALED ☐ UNSEALED ☐			[signature] 9/11/01 SEALED ☐ UNSEALED ☐	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED ☐ UNSEALED ☐			SEALED ☐ UNSEALED ☐	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED ☐ UNSEALED ☐			SEALED ☐ UNSEALED ☐	

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Kent Bion	Laramie Coal Gas	5-7-91	2 of 2

CONTENTS OF SHIPMENT

SAMPLE NUMBER	SUBTANCE	CONC.	CONC. UNIT	PRESERVATIVE	SAMPLED MEDIA: Aqueous	Soil	Sediment	Liquid	Other	RECEIVING LABORATORY REMARKS OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
LCG-14-10		2				✓				
10a		2				✓				
10		2				✓				
10		2				✓				
10		2				✓				
106		2				✓				
107		2				✓				
108		2				✓				
109		2				✓				
401		3		2			✓			
401D		3		2			✓			
402		3		2			✓			
403		3		2			✓			
total		30		8						

DESCRIPTION OF SHIPMENT

2 PIECE(S) CONSISTING 2

ICE CHEST SAMPLER

MODE OF SHIPMENT

COMMERCIAL CARRIER

COURIER

SAMPLER CONVEYED

(SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
[signature]	5/7/91	[signature]	
☒ SEALED ☐ UNSEALED		☐ SEALED ☐ UNSEALED	
RELINQUISHED BY	DATE	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED ☐ UNSEALED		☐ SEALED ☐ UNSEALED	
RELINQUISHED BY	DATE	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED ☐ UNSEALED		☐ SEALED ☐ UNSEALED	

EPA-9252.9 (1-85)

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Keith M. Brown	LACLEDE COAL GAS	9 1	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	CONTAINER NUMBERS	VOLUME	CASE NO. / LAB SEA	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS OTHER INFORMATION (condition of samples upon receipt, other sample numbers etc.)
DSHW-001		2			✓				
-002		2			✓				
-003		2			✓				
-004		2			✓				
V -005		2			✓				

DESCRIPTION OF SHIPMENT

10 PIECE(S) CONSISTING OF 1

ICE CHEST(S), OTHER

MODE OF SHIPMENT

COMMERCIAL CARRIER

COURIER

SAMPLER CONVEYED

(SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
Keith Brown	9/1			
☒ SEALED ☐ UNSEALED			☐ SEALED ☐ UNSEALED	
RELINQUISHED BY			RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED ☐ UNSEALED			☐ SEALED ☐ UNSEALED	
RELINQUISHED BY			RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED ☐ UNSEALED			☐ SEALED ☐ UNSEALED	

7-EPA-9262 (Revised 1-85)

APPENDIX F

MDNR WELL LOGS

RELEASED

Reported to STATE OF MISSOURI DIVISION OF GEOLOGICAL SURVEY AND WATER RESOURCES

LOG NO.	OWNER		
25548	Laclede Gas Co.		
COUNTY	FARM		WELL NO.
St. Louis	Missouri Hills		2-S
T 47 R 7E	DRILLER		
600' N-SL 330' W-EL	DATE Spud. 16-March 68 Comp: 19-3-68		
	ELEV. 438 ...	PROD. Plugged w/20 sx ...	INDEX SHEET NO.
	LOGGED BY J.H. Ellis		

REMARKS 18' of 6 5/8" surface csg. pulled when plugged.

No Release...
Log & all data released from confidential ... DEC Rule 7-4(a) ...

100

200

No spls returned below 263'

300

Top picked from ... log

400

T.D. 433'

500

600

MO SURVEY NO.	OWNER	
18747	Schorr-Kolkschneider	
COUNTY	FARM	WELL NO.
St. Louis		1
T 45 R 7E	DRILLER Sewell - contr.	
	DATE 1915	
	ELEVATION 475	PRODUCTION 100 G.P.M.
	SAMPLES STUDIED C.D. Gleason	

REMARKS ... W. of Natural Bridge & Parnell ... Abandoned ... from St. Peter ...

0

50

100

150

200

250

300

350

400

475 / 375

450

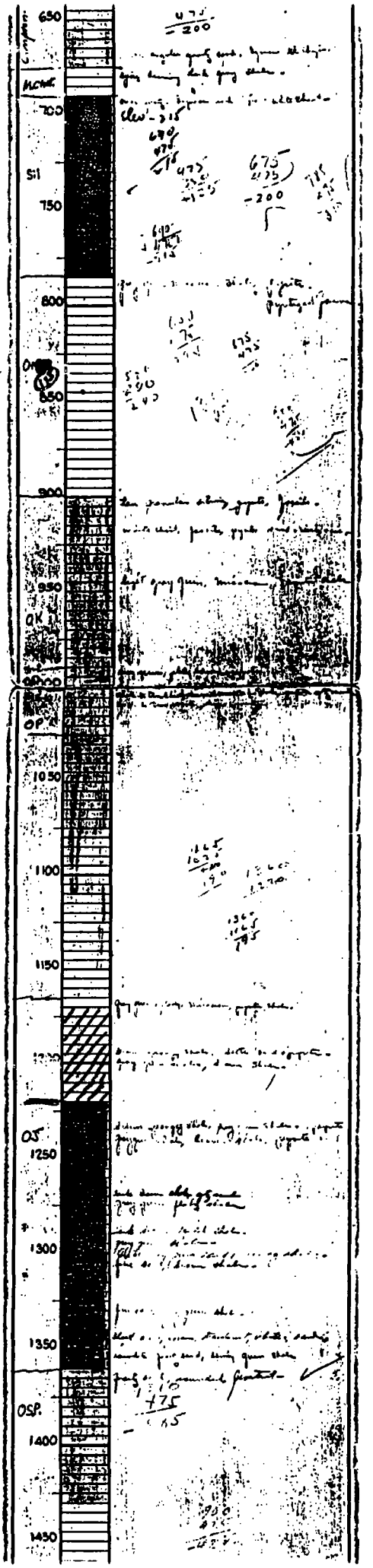
500

550

600

650

200


650
700
750
800
850
900
950
1050
1100
1150
1250
1300
1350
1400
1450

APPENDIX G

ON-SITE DRILLING AND SAMPLING LOGS
MARCH 4 THROUGH 9, 1991

ecology and environment, inc.
OVERLAND PARK, KANSAS

FT1307 FM00579SA

DRILLING & SAMPLING LOG

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: N/A
Site Location: St. Louis, Missouri
Boring Diameter: 5 inch
Boring Well Location: BØ1
Screen Size & Type: N/A
Boring/Well No.: BØ1 (1-12)
Screened Interval: N/A
Drilling Contractor: John Mathes & Assoc.
Well Diameter: N/A
Drilling Equipment: CME 550 ATV Solid Stem Auger
Date: March 4, 1991
Driller: Keith Bunselmeyer
Start Time: 13:05 Completion Time: 14:00
Geologist: Wesley McCall
Total Depth of Hole: 18 Ft Groundwater Depth: ~6 ft
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks
0.0					Gravel and Sand	HNU = NAB*
	BØ1-A				Black - grey, clay with sand and gravel	
5.0						
	BØ1-B				Black loamy soil with gravel + sparse clay balls	NAB
9.0					Black loamy soil with gravel and brown clay balls	NAB
10.0						
	BØ1-C				fine gravel and sand in black grey clay	NAB
13					medium gravel and brick fragments	NAB Tar-like odor
15					Black grey clay sparse angular gravel and brick fragments	Coal-tar like odor, oily sheen NAB
18					— Refusal @ ~ 18 ft	

1-1

ecology and environment, inc.
OVERLAND PARK, KANSAS

FT1307 FM00579SA

DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Site Location: St. Louis, Missouri
Boring Well Location: BH2
Boring/Well No.: BH2 (1-14)
Drilling Contractor: John Mathes & Assoc.
Drilling Equipment: CME 550 ATV Solid Stem Auger
Driller: Keith Bunselmeyer
Geologist: Wesley McCall
Driller's Helper(s): Jim Barker, Jeff Crank

Well Casing Size, Type, Quantity: N/A
Boring Diameter: 5 inch
Screen Size & Type: N/A
Screened Interval: N/A
Well Diameter: N/A
Date: March 4, 1991
Start Time: 14:25 Completion Time: 14:55
Total Depth of Hole: 21 ft Groundwater Depth: —
Completion Depth: — Surface Elevation: —

ft.	Depth	Sample	N-Value Number of Blows/6"	Graphic Log	Completion Date	Description	Remarks
						Black loamy soil, gravel, wood chips, coal cinders	—
7.0						Medium Brown clay	—
5.0						Greenish Brown clay	Coal tar odor HNu = 2ppm
7.0						Grey clay with sparse sand and gravel	HNu = 2ppm
12						Dark grey clay with sparse gravel	HNu = 20 ppm
17						Dark grey clay with brick fragments	HNu = 60 ppm down bore hole
21						Refusal at 21 ft	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: N/A
Site Location: St. Louis, Missouri
Boring Diameter: 5 inch
Boring Well Location: B03
Screen Size & Type: N/A
Boring/Well No.: B03
Screened Interval: N/A
Drilling Contractor: John Mathes & Assoc.
Well Diameter: N/A
Drilling Equipment: CME 550 ATV Solid Stem Auger
Date: March 4, 1991
Driller: Keith Bunselmeyer
Start Time: 15:50 Completion Time: 16:05
Geologist: Wesley McCall
Total Depth of Hole: 19 Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Ft.	Depth	Sample	N-Value Number of Blows/6"	Graphic Log	Completion Date	Description	Remarks
						Gravel and gray black soil	
2.0						Black clay loam soil with coal cinders and wood chips	Heavy tar-like odor HNU = 2.5 ppm.
3.0						Green plastic clay with minor silt	HNU = 2ppm
5						Green plastic clay	HNU = 2ppm
15						Wood fragments	
16						Black oily, tarry ooze with coal cinders	HNU = 2ppm
18						Gray Black Clay	
19						Refusal at 19'	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: N/A
Site Location: St. Louis, Missouri
Boring Diameter: 5 in
Boring Well Location: 304
Screen Size & Type: N/A
Boring/Well No.: [illegible]
Screened Interval: N/A
Drilling Contractor: John Mathes & Assoc.
Well Diameter: N/A
Drilling Equipment: CME 550 ATV Solid stem auger
Date: March 4, 1991
Driller: Keith Bunselmeyer
Start Time: 16:45 Completion Time: 21:54
Geologist: Wesley McCall
Total Depth of Hole: 19 Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks
					Gravel and fine sandy soil	
3.0					Gravel, brick fragments gray sand	
7.0					Gravel and brick fragments in gray sand	
15					Gravel with brick and wood fragments	
19					Refusal at 19 ft	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Site Location: St. Louis, Missouri
Boring Well Location: BH-5
Boring/Well No.: BH-5
Drilling Contractor: John Mathes & Assoc.
Drilling Equipment: CME 550 ATV, solid stem auger
Driller: Keith Bunselmeyer
Geologist: Wesley McCall
Driller's Helper(s): Jim Barker, Jeff Crank

Well Casing Size, Type, Quantity: N/A
Boring Diameter: 5 inch
Screen Size & Type: N/A
Screened Interval: N/A
Well Diameter: N/A
Date: March 4, 1991
Start Time: 17:25 Completion Time: 18:00
Total Depth of Hole: 26 Groundwater Depth: —
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks
					Sand and gravel with brown sandy soil matrix	
2.0					gray black clay	slight coal-tar odor
4.0					gray black clay	HNU = 0.4 ppm
8.0					greenish gray clay, plastic	HNU = 0.4 ppm
22.0					same as above	HNU = 10 ppm
26.0					same as above	
					→ Refusal at 26 ft bedrock = limestone	HNU = 1 ppm down open auger hole

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: N/A
Site Location: St. Louis, Missouri
Boring Diameter: 5 inch
Boring Well Location: B#6
Screen Size & Type: N/A
Boring/Well No.: B#6
Screened Interval: N/A
Drilling Contractor: John Mathes & Assoc.
Well Diameter: N/A
Drilling Equipment: CME 550 ATV, solid stem auger
Date: March 5, 1991
Driller: Keith Bunselmeyer
Start Time: 13:25 Completion Time: 15:55
Geologist: Wesley McCall
Total Depth of Hole: 10 Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: 10 Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks
					gravel and gray sandy soil	
					black tarry clay soil with gravel	HNu > 5 ppm
					black tarry ooze oily sheen, brown clay balls	HNu = 1 ppm
					as above with some gravel	HNu = 8 ppm
					Auger is broke between 2nd and 3rd auger, unable to retrieve.	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: N/A
Site Location: St. Louis, Missouri
Boring Diameter: 5 inch
Boring Well Location: B&B B
Screen Size & Type: N/A
Boring/Well No.: B&B B
Screened Interval: N/A
Drilling Contractor: John Mathes & Assoc.
Well Diameter: N/A
Drilling Equipment: CME 550 ATV, solid stem auger
Date: March 5, 1991
Driller: Keith Bunselmeyer
Start Time: 11:25 Completion Time: 12:20
Geologist: Wesley McCall
Total Depth of Hole: 38 Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks
					Gravel, sand, brick fragments	
3.0					Green gray clay	coal tar odor
5.0					Green gray clay with coal and brick fragments	HNU = 10ppm
10.0					as above	HNU = 10ppm
15.0					Greenish gray clay, plastic, with fragments of coal-coke	HNU = 10ppm
20.0					Greenish gray clay	
25.0					Brownish green clay	(continued)

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CONTINUATION SHEET

Project Name & Number: Laclede Coal Gas

Date: March 5, 1991

Site Location: St. Louis, Missouri

Boring Well Location: B-3 & B

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks
10					Compact greenish brown clay with trace of fine sand - silt	
20					Brown clay saturated with black tarry oils	HNU = 2 ppm
					Refusal at 35 FT Bedrock !	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: N/A
Site Location: St. Louis, Missouri
Boring Diameter: 5 inch
Boring Well Location: B-7
Screen Size & Type: NA
Boring/Well No.: B-7
Screened Interval: NA
Drilling Contractor: John Mathes & Assoc.
Well Diameter: NA
Drilling Equipment: CME 550 ATV 6 1/4" stem auger
Date: March 5, 1991
Driller: Keith Bunselmeyer
Start Time: 12:15 Completion Time: 15:10
Geologist: Wesley McCall
Total Depth of Hole: 29 ft Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of Blows/6"	Graphic Log	Completion Date	Description	Remarks
					Gravel and brick fragments in dk gray sandy soil	HNU = N/A
					Black ooze, coal-coke fragments, wood fibers, greenish gray clay balls	HNU = 14 ppm
					Black ooze with coke slag and wood fragments sparse gray-green clay balls	HNU = 10 ppm
					Black ooze with coke & slag fragments	HNU = 7 ppm
					Dry, plastic green clay	
					Green clay with sparse gravel	
					Green gray clay w. the increasing limestone fragments	
					Refusal at 29 ft. on Limestone bedrock	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: NA
Site Location: St. Louis, Missouri
Boring Diameter: 8 inch
Boring Well Location: B #8
Screen Size & Type: NA
Boring/Well No.: B & K
Screened Interval: NA
Drilling Contractor: John Mathes & Assoc.
Well Diameter: NA
Drilling Equipment: CME 550 ATV Solid stem auger
Date: March 5, 1991
Driller: Keith Bunselmeyer
Start Time: 15:20 Completion Time: 16:00
Geologist: Wesley McCall
Total Depth of Hole: — Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks
					Abort Location. Shallow refusal at several points. Brick + Concrete foundation.	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Site Location: St. Louis, Missouri
Boring Well Location: B19
Boring/Well No.: B19
Drilling Contractor: John Mathes & Assoc.
Drilling Equipment: CME 550 ATV, solid stem auger
Driller: Keith Bunselmeyer
Geologist: Wesley McCall
Driller's Helper(s): Jim Barker, Jeff Crank

Well Casing Size, Type, Quantity: N/A
Boring Diameter: 5 inch
Screen Size & Type: N/A
Screened Interval: N/A
Well Diameter: N/A
Date: March 5, 1991
Start Time: 16:08 Completion Time: 16:55
Total Depth of Hole: — Groundwater Depth: —
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of Blows/6"	Graphic Log	Completion Date	Description	Remarks
					Abort Location, Shallow refusal at several points, Concrete Foundation.	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Site Location: St. Louis, Missouri
Boring Well Location: B1f
Boring/Well No.: B1f
Drilling Contractor: John Mathes & Assoc.
Drilling Equipment: CME 550 ATV, solid stem augers
Driller: Keith Bunselmeyer
Geologist: Wesley McCall
Driller's Helper(s): Jim Barker, Jeff Crank

Well Casing Size, Type, Quantity: N/A
Boring Diameter: 3 inch
Screen Size & Type: N/A
Screened Interval: N/A
Well Diameter: N/A
Date: March 5, 1991
Start Time: 10:05 Completion Time: 17:35
Total Depth of Hole: ____ Groundwater Depth: ____
Completion Depth: ____ Surface Elevation: ____

Depth	Sample	N-Value Number of Blows/6"	Graphic Log	Completion Date	Description	Remarks
					Abort Location, shallow refusal at several points. Concrete Foundation.	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: N/A
Site Location: St. Louis, Missouri
Boring Diameter: 5 inch
Boring Well Location: B11
Screen Size & Type: N/A
Boring/Well No.: B11
Screened Interval: N/A
Drilling Contractor: John Mathes & Assoc.
Well Diameter: N/A
Drilling Equipment: CME 550 ATV Solid stem auger
Date: March 6, 1991
Driller: Keith Bunselmeyer
Start Time: 08:10 Completion Time: 08:35
Geologist: Wesley McCall
Total Depth of Hole: 15 Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks
					Gravel and sand, medium brown clay soil	
					medium brown clay	
					medium brown clay with sparse brick fragments	
					medium brown clay soil brick fragments	
					grey black clay, wet	
					Refusal at ~15 ft	HNU = 85 ppm down open boring

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: NA
Site Location: St. Louis, Missouri
Boring Diameter: 5 inch
Boring Well Location: B12
Screen Size & Type: NA
Boring/Well No.: B 12
Screened Interval: NA
Drilling Contractor: John Mathes & Assoc.
Well Diameter: N H
Drilling Equipment: CME 550 ATV, solid stem auger
Date: March 6, 1991
Driller: Keith Bunselmeyer
Start Time: 09:05 Completion Time: 09:35
Geologist: Wesley McCall
Total Depth of Hole: 11 Ft Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of Blows/6"	Graphic Log	Completion Date	Description	Remarks
					Gravel and sand	
					Brown clay loam	
					Greenish gray clay	HNU = NAB
					plastic greenish gray clay, damp, oily sheen	
					Greenish gray clay with tarry ooze	coal tar odor
					Refusal at 11 ft	HNU > 50 ppm down open bore hole.

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: NA
Site Location: St. Louis, Missouri
Boring Diameter: 5 inch
Boring Well Location: B13
Screen Size & Type: NA
Boring/Well No.: B13
Screened Interval: NA
Drilling Contractor: John Mathes & Assoc.
Well Diameter: NA
Drilling Equipment: CME 550 ATV, solid stem auger
Date: March 6, 1991
Driller: Keith Bunselmeyer
Start Time: 09:45 Completion Time: —
Geologist: Wesley McCall
Total Depth of Hole: 12 Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of Blows/6"	Graphic Log	Completion Date	Description	Remarks
1					Gravel and Sand	
					Poor recovery — wet black ooze with abundant brick fragments	
5					black wet ooze, brick fragments Poor Recovery	
10					Grey Black clay, brick fragments, black ooze	
12					Refusal at 12 ft	Raining, no HNU readings.

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: N/A
Site Location: St. Louis, Missouri
Boring Diameter: 5 inch
Boring Well Location: B14
Screen Size & Type: N/A
Boring/Well No.: B14
Screened Interval: N/A
Drilling Contractor: John Mathes & Assoc.
Well Diameter: N/A
Drilling Equipment: CME 550 ATV, solid stem augers
Date: March 6, 1991
Driller: Keith Bunselmeyer
Start Time: 10:35 Completion Time: 11:25
Geologist: Wesley McCall
Total Depth of Hole: 20 21 Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks
1					Gravel and sandy soil	
					very little recovery. Black oil on auger with traces of soil, gravel and brick fragments	
8					Very little recovery over entire interval, Black oil on augers. Sparse clay and brick fragments.	HNU = 40 ppm Subsurface fluid may be stripping augers.
6					↑ Refusal @ ~20 ft	Screening sample of oil collected at ~3 ft depth in 8 oz jar

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Site Location: St. Louis, Missouri
Boring Well Location: B15
Boring/Well No.: B15
Drilling Contractor: John Mathes & Assoc.
Drilling Equipment: CME 550 ATV, solid stem auger
Driller: Keith Bunselmeyer
Geologist: Wesley McCall
Driller's Helper(s): Jim Barker, Jeff Crank

Well Casing Size, Type, Quantity: NA
Boring Diameter: 5 inch
Screen Size & Type: NA
Screened Interval: NA
Well Diameter: NA
Date: March 6, 1991
Start Time: 14:05 Completion Time: 14:50
Total Depth of Hole: 31 ft Groundwater Depth: —
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks
1					Gravel, brown clay loam soil	
3					Greenish brown clay, with black tarry material	
5					Black tar saturated soil - plastic	
10					black tar saturated sand, some greenish gray clay balls	
15					Black tar saturated sand, brick fragments, silty areas	HNU >20 ppm
20					Black tarry sand (asphalt?)	
23					Gray black clay	
25					Black, wet, wood chips	
27					Grey green clay with brick fragments.	wet

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: N/A
Site Location: St. Louis, Missouri
Boring Diameter: 5 inch
Boring Well Location: B16
Screen Size & Type: N/A
Boring/Well No.: B16
Screened Interval: NA
Drilling Contractor: John Mathes & Assoc.
Well Diameter: NA
Drilling Equipment: CME 550 ATV, 4 1/4" stem auger
Date: March 6, 1991
Driller: Keith Bunselmeyer
Start Time: 1505 Completion Time: 1524
Geologist: Wesley McCall
Total Depth of Hole: 3' Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of Blows/6"	Graphic Log	Completion Date	Description	Remarks
					Repeated refusal at ~3 Ft depth on foundation. Abort Location	HNU ~ 1.5 ppm down 3 Ft hole

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Site Location: St. Louis, Missouri
Boring Well Location: B17
Boring/Well No.: B17
Drilling Contractor: John Mathes & Assoc.
Drilling Equipment: CME 550 ATV, Solid Stem auger
Driller: Keith Bunselmeyer
Geologist: Wesley McCall
Driller's Helper(s): Jim Barker, Jeff Crank

Well Casing Size, Type, Quantity: NA
Boring Diameter: 5 inch
Screen Size & Type: NA
Screened Interval: NA
Well Diameter: NA
Date: March 6, 1991
Start Time: 15:38 Completion Time: 16:40
Total Depth of Hole: 33 ft Groundwater Depth: —
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of Blows/6"	Graphic Log	Completion Date	Description	Remarks
					Black sandy loam soil with sub rounded pebbles	
					Black loamy soil with coal + cinders	
					Grey black clay, sparse brick fragments and coal cinders	
5					Sandy grey black clay with sparse brick fragments	HNU = NAB
					Sandy greenish black clay	
					Brownish clay with abundant angular gravel	
5					Grey black clay with coal cinders	
0					Sandy green black clay with sparse angular pebbles	HNU = 4 ppm Minitox = 0 ppm
5					Sandy green black clay proportion of sand to pebbles increases with depth	HNU = 35 ppm

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: N/A
Site Location: St. Louis, Missouri
Boring Diameter: 5 inch
Boring Well Location: B13
Screen Size & Type: N/A
Boring/Well No.: B13
Screened Interval: N/A
Drilling Contractor: John Mathes & Assoc.
Well Diameter: N/A
Drilling Equipment: CME 550 ATV, solid Stem Auger
Date: March 6, 1991
Driller: Keith Bunselmeyer
Start Time: 16:50 Completion Time: 17:25
Geologist: Wesley McCall
Total Depth of Hole: 33 ft Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

ft.	Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks
2						Brown sandy soil with sparse gravel	
5						Black sandy clay, sparse angular gravel	HNU = 110 ppm
8						Black clay, coarse sand and sparse angular gravel	
10						Wet gray black clay with medium sand	HNU = 500 ppm
16						Gray black clay with coarse to medium sand	HNU = 200 ppm
25						Greenish black clay	HNU = 130 ppm
						Greenish black clay (wet)	HNU = NAB

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: N/A
Site Location: St. Louis, Missouri
Boring Diameter: 5 in.
Boring Well Location: B19
Screen Size & Type: N/A
Boring/Well No.: B19
Screened Interval: N/A
Drilling Contractor: John Mathes & Assoc.
Well Diameter: N/A
Drilling Equipment: CME 550 ATV, solid stem auger
Date: March 7, 1991
Driller: Keith Bunselmeyer
Start Time: 08:20 Completion Time: 09:13
Geologist: Wesley McCall
Total Depth of Hole: 30 ft Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks
					brown sandy loam soil with gravel	
					Black sludge of coal cinders, slag, and spare brick fragments	HNU = 1 ppm
					Black sandy clay with limestone gravel and coal cinders, slag	
					Wet black sand?, abundant coal cinders and brick fragments	HNU - NAB

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Site Location: St. Louis, Missouri
Boring Well Location: B2¢
Boring/Well No.: B2¢
Drilling Contractor: John Mathes & Assoc.
Drilling Equipment: CME 550 ATV, solid stem auger
Driller: Keith Bunselmeyer
Geologist: Wesley McCall
Driller's Helper(s): Jim Barker, Jeff Crank

Well Casing Size, Type, Quantity: NA
Boring Diameter: 5 inch
Screen Size & Type: NA
Screened Interval: NA
Well Diameter: NA
Date: March 7, 1991
Start Time: 09:19 Completion Time: 10:20
Total Depth of Hole: 30ft Groundwater Depth: —
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of Blows/6"	Graphic Log	Completion Date	Description	Remarks
0					Coal waste. Sandy coal cinders and clay, some brick fragments and gravel	HNu = NA B
15					as above with wood fragments + fibers	
17					as above : wet	
28					Sandy gray black clay	
30						

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Site Location: St. Louis, Missouri
Boring Well Location: B21
Boring/Well No.: B21
Drilling Contractor: John Mathes & Assoc.
Drilling Equipment: CME 550 ATV
Driller: Keith Bunselmeyer
Geologist: Wesley McCall
Driller's Helper(s): Jim Barker, Jeff Crank

Well Casing Size, Type, Quantity: NA
Boring Diameter: 5 inch
Screen Size & Type: NA
Screened Interval: NA
Well Diameter: NA
Date: March 7, 1991
Start Time: 10:30 Completion Time: ~~11:10~~ 11:10
Total Depth of Hole: _____ Groundwater Depth: _____
Completion Depth: _____ Surface Elevation: _____

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks
					Shallow refusal (<3ft) at several points. Limestone bedrock. About Location	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: N/A
Site Location: St. Louis, Missouri
Boring Diameter: 5 inch
Boring Well Location: B 22
Screen Size & Type: N/A
Boring/Well No.: B 22
Screened Interval: N/A
Drilling Contractor: John Mathes & Assoc.
Well Diameter: N/A
Drilling Equipment: CME 550 ATV, solid stem auger
Date: March 7, 1991
Driller: Keith Bunselmeyer
Start Time: 11:14 Completion Time: 11:25
Geologist: Wesley McCall
Total Depth of Hole: 2 Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks
					Fill to residual (~2 ft) at several points. Limestone bedrock. Auger refusal.	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: NA
Site Location: St. Louis, Missouri
Boring Diameter: 5 inch
Boring Well Location: B23
Screen Size & Type: NA
Boring/Well No.: B23
Screened Interval: NA
Drilling Contractor: John Mathes & Assoc.
Well Diameter: NA
Drilling Equipment: CME 550 ATV, Solid Stem Auger
Date: March 7, 1991
Driller: Keith Bunselmeyer
Start Time: 11:30 Completion Time: 12:45
Geologist: Wesley McCall
Total Depth of Hole: 4 Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Data	Description	Remarks
					Brown loam soil to 6 inches	
					Red brown sandy clay loam with gravel	
					Weathered bedrock, red-brown	
					Refusal at 4 ft. Limestone bedrock	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: NA
Site Location: St. Louis, Missouri
Boring Diameter: 5 inch
Boring Well Location: B24
Screen Size & Type: NA
Boring/Well No.: B24
Screened Interval: NA
Drilling Contractor: John Mathes & Assoc.
Well Diameter: NA
Drilling Equipment: CME 550 ATV, solid stem auger
Date: March 7, 1991
Driller: Keith Bunselmeyer
Start Time: 13:30 Completion Time: 14:05
Geologist: Wesley McCall
Total Depth of Hole: 23 ft Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks
1					Gravel, brown sandy soil	
					Grayish green clay with sparse coal-coke fragments	
5					Grayish green clay, damp, plastic	HNU = NAB
15					same as above, traces of coal tar	coal tar odor HNU = NAB
20					Sandy green clay, trace of coal-coke fragments	
22					Sandy black tarry material with coal-coke fragments	slight coal tar odor
23					Refusal at 23 ft	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Site Location: St. Louis, Missouri
Boring Well Location: B24
Boring/Well No.: C.S.-
Drilling Contractor: John Mathes & Assoc.
Drilling Equipment: CME 550 ATV, Hollow stem Auger
Driller: Keith Bunselmeyer
Geologist: Wesley McCall
Driller's Helper(s): Jim Barker, Jeff Crank

Well Casing Size, Type, Quantity: N/A
Boring Diameter: 3.75 ID
Screen Size & Type: N/A
Screened Interval: N/A
Well Diameter: N/A
Date: March 17, 19-11
Start Time: 14:10 Completion Time: 17:20
Total Depth of Hole: 23 Ft Groundwater Depth: —
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of Blows/6"	Graphic Log	Completion Date	Description	Remarks
1	SS				Sand and Gravel	
					Green brown sandy clay with gravel + sparse coal fragments	
3	SS				No Recovery	No Recovery
5	SS				Brown + black mottled clay sparse coal + gravel fragments	
7					Brown Clay	
7.5	SS				Grey black clay with coal cinders	
9	SS				Black mottled green clay	~70% Recovery
11	SS				Greenish grey clay with black mottling (Manganese)	~40% Recovery ~95% Recovery " " ~30% Recovery
14	SS				Compact green clay, silty layer + no black mottling	~ 25% Recovery
21	SS				Black mottled green clay with fine sand	~ 40% Recovery
23					↑ Refusal at ~23 Ft fine grained crystalline limestone = bedrock	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: N/A
Site Location: St. Louis, Missouri
Boring Diameter: 4.25 inch ID
Boring Well Location: BG6
Screen Size & Type: N/A
Boring/Well No.: CS2
Screened Interval: N/A
Drilling Contractor: John Mathes & Assoc.
Well Diameter: N/A
Drilling Equipment: CME 550 ATV, Hollow stem auger
Date: March 6, 1991
Driller: Keith Bunselmeyer
Start Time: 09:01 Completion Time: 10:12
Geologist: Wesley McCall
Total Depth of Hole: 18 Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks (PID Reading)
	—				Gravel, rock, rubble. Drilled in fill	No sample
	CS				Black sandy sludge with oily sheen, some gravel fragments	(≈ 20%) HNU = NAB
	CS				Green compact clay sparse areas of tar contamination	(≈ 85%)
	CS				Green compact clay with black manganese mottling	(≈ 95%)
					Halt boring advancement	HNU = 25 ppm down open core hole

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Site Location: St. Louis, Missouri
Boring Well Location: B/L
Boring/Well No.: CS3
Drilling Contractor: John Mathes & Assoc.
Drilling Equipment: CME 550 ATV, Hollow stem auger
Driller: Keith Bunselmeyer
Geologist: Wesley McCall
Driller's Helper(s): Jim Barker, Jeff Crank

Well Casing Size, Type, Quantity: N/A
Boring Diameter: 4.25 inch ID
Screen Size & Type: NA
Screened Interval: NA
Well Diameter: N/A
Date: March 5, 1991
Start Time: 10:15 Completion Time: 11:30
Total Depth of Hole: 14 ft Groundwater Depth: —
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks (inc Recovery)
	—				Gravel, rock in black soil, tarry zones	No sample
	CS				Green black sandy clay with rock and brick fragments	(45%) Brick in nose of sampler
	SS				Green compact clay with zones of tar contamination	HNU = 3ppm
					as above	see photo #20 roll #1
					Black tarry clay	HNU = 7 ppm
					Green Compact Clay	No contamination observed
					14 ft 4 1/4 boring advancement	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Site Location: St. Louis, Missouri
Boring Well Location: 314
Boring/Well No.: 554
Drilling Contractor: John Mathes & Assoc.
Drilling Equipment: CME 550 ATV, Hollow Stem Auger
Driller: Keith Bunselmeyer
Geologist: Wesley McCall
Driller's Helper(s): Jim Barker, Jeff Crank

Well Casing Size, Type, Quantity: NA
Boring Diameter: 4.25 inch I.D.
Screen Size & Type: NA
Screened Interval: NA
Well Diameter: NA
Date: March 5, 1991
Start Time: 12:40 Completion Time: 14:35
Total Depth of Hole: 14 Groundwater Depth: —
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of Blows/6"	Graphic Log	Completion Date	Description	Remarks (% Recovery)
—	—				Gravel, rubble, sandy soil	No sample
—	SS				Black tarry sandy clay soil brick & wood fragments	(~25%)
—	SS				Sand, gravel & brick fragments saturated with greenish black oil	(~10%)
—	SS					(~25%) HNU ≈ 9 ppm
—	SS				Augers coated with oil	No recovery
					Brick fragments, gravel & sand coated with oil	(~5%)
					Brick and concrete fragments in sand, saturated with oil	(~10%)
					Refusal at 14 ft.	HNU ≈ 13 ppm Open open bore hole. Sample of oil and water collected from split spoon.

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Site Location: St. Louis, Missouri
Boring Well Location: ~~###~~ BD7
Boring/Well No.: CS5
Drilling Contractor: John Mathes & Assoc.
Drilling Equipment: CME 550 ATV, Hollow stem augers
Driller: Keith Bunselmeyer
Geologist: Wesley McCall
Driller's Helper(s): Jim Barker, Jeff Crank

Well Casing Size, Type, Quantity: N/A
Boring Diameter: 4.25 inch I.D.
Screen Size & Type: N/A
Screened Interval: N/A
Well Diameter: N/A
Date: March 5, 1991
Start Time: ~~10:00~~ 14:10 pm Completion Time: ~~14:30~~ pm
Total Depth of Hole: 14 ft Groundwater Depth: —
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks (% Recovery)
—	—				Gravel and brick fragments in black soil	No Sample
	SS				Dark green compact clay with black heavy mottling	(95%) Hnu = NAB
	SS				Dark green sandy clay brick fragments	(~20%)
	SS				Green black clay, brick and limestone fragments, Pens at coarse sand zone pebbles	(~50%) Hnu ≈ 200 ppm
					Refusal at split spoon at 14 ft.	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Site Location: St. Louis, Missouri
Boring Well Location: B-7
Boring/Well No.: CS6
Drilling Contractor: John Mathes & Assoc.
Drilling Equipment: CME 550 ATV
Driller: Keith Bunselmeyer
Geologist: Wesley McCall
Driller's Helper(s): Jim Barker, Jeff Crank

Well Casing Size, Type, Quantity: NA
Boring Diameter: 4.25 inch ID
Screen Size & Type: NA
Screened Interval: NA
Well Diameter: NA
Date: March 8 1991
Start Time: 16:50 Completion Time: 17:45
Total Depth of Hole: 17' Groundwater Depth: —
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks (% Recovery)
	NS					No Sample; Bore hole adjacent to CS5
	SS				Coarse sand and gravel green clay bottom 6 inches	
	SS				Alternating layers of sand + gravel and green clay	oil saturated (40%)
	SS				Coarse sand, medium rounded gravel	(100%)
	SS				Wood fibers, black tarry sands green compact clay last 2 inches	(100%)
					End of Augering in bottom	

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DRILLING & SAMPLING LC

Project Name & Number: Laclede Coal Gas
Well Casing Size, Type, Quantity: N/A
Site Location: St. Louis, Missouri
Boring Diameter: 8.25 inch ID
Boring Well Location: B15
Screen Size & Type: N/A
Boring/Well No.: CS7
Screened Interval: N/A
Drilling Contractor: John Mathes & Assoc.
Well Diameter: N/A
Drilling Equipment: CME 550 ATV, Hollow stem Auger
Date: March 9, 1991
Driller: Keith Bunselmeyer
Start Time: 09:45 Completion Time: 09:45
Geologist: Wesley McCall
Total Depth of Hole: 12.5 Groundwater Depth: —
Driller's Helper(s): Jim Barker, Jeff Crank
Completion Depth: — Surface Elevation: —

Depth	Sample	N-Value Number of blows/6"	Graphic Log	Completion Date	Description	Remarks
	NS					No Sample
	SS				Sandy green-black clay with brick	(50%)
	SS					(40%)
	SS				Green-black sandy clay with brick fragments	(10%) Photo 8, roll 2
					Black wet clay with brick fragments + gravel	Photo 9, roll 2
					Black Sand, fine subrounded gravel, c	coal cinders ~~##~~
					↑ Refusal at ~12.5 ft	HNu ≃ 3 ppm down open bore hole